

ALGEBRA – MODEL No 1**[Q1] Choose the correct answer:****(1)** If $x^2 + 10x + k$ is perfect square, then $k = \dots\dots\dots$

- a) 100 b) 25 c) 20 d) 10

(2) The solution set of: $3x^2 = 3x$ in R is $\dots\dots\dots$

- a) $\{3, -1\}$ b) $\{-3, 1\}$ c) $\{0, 1\}$ d) $\{1, 3\}$

(3) If $3^x = 5$, $3^y = 7$, then $3^{x+y} = \dots\dots\dots$

- a) 12 b) 15 c) 21 d) 35

(4) If: $x^2 + ax - 12$ can be factorize, then $a = \dots\dots\dots$

- a) 7 b) 8 c) 4 d) 13

(5) Which of the following is true ($x \in R$)

- a) $9^x > 0$ b) $x + 9 > 0$ c) $x^9 > 0$ d) $9x > 0$

(6) If the age of a man now is x year, then his age after 5 years is

- a) $X + 5$ b) $X - 5$ c) $5x$ d) x

[Q2] Complete each of the following:1) If: $k^2 + m^2 = 21$, $km = 3$, then $k + m = \dots\dots\dots$ 2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is $\dots\dots\dots$ 3) If Sixth of the number $(2^{12} \times 3^{12}) = 6^k$, then $k = \dots\dots\dots$ 4) The S.S: $x^3 + 25x = 0$ in R is $\dots\dots\dots$ 5) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) ① $x^6 - 7x^3 - 8$ ② $16x^2 - a^2 + 6ax - 9x^2$

B) Use factorization to get the value of each of the following easily:

① $(14.06)^2 - 8.12 \times 14.06 + (4.06)^2$ ② $(998)^2 - 4$

[Q4]

A) Find real number that its twice exceed to its multiplicative inverse by 1 ?

B) find the value of x in each of the following :

① $3^{x-1} = 27$ ② $3^{x-3} = 2^{2x-6}$

[Q5] A) If $\frac{8^x \times 3^{2x}}{18^x} = 64$, then find the value of 4^{-x}

B) A box contains 40 cards numbered from 1 to 40 . a card is drawn randomly. Calculate the probability of drawing card carrying :

- ① An even number
- ② A number divisible by 5
- ③ A number is perfect square
- ④ A prim number less than 18



End of the questions

ALGEBRA – MODEL No 2**[Q1] Choose the correct answer:**(1) If : $x^2 - kx + 25$ is perfect square then $k = \dots\dots\dots$

- a) 5 b) 25 c) ± 10 d) ± 5

(2) $4^3 + 4^3 + 4^3 + 4^3 = \dots\dots\dots$

- a) 4^4 b) $(16)^3$ c) 4^{12} d) 4^{81}

(3) If $x = \frac{\sqrt{9}}{\sqrt{3}}$, then $x^{-1} = \dots\dots\dots$

- a) $\sqrt{3}$ b) 2 c) $\frac{\sqrt{3}}{\sqrt{2}}$ d) $\frac{\sqrt{3}}{3}$

(4) If : $k - m = 9$, $k + m = 15$ then $k^2 - m^2 = \dots\dots\dots$

- a) 135 b) 9 c) 150 d) $\frac{3}{5}$

(5) $2^0 + 2^{-1} - \left(\frac{-1}{\sqrt{2}}\right)^2 = \dots\dots\dots$

- a) 2 b) 0 c) 1 d) -1

(6) Quarter of $(\sqrt{2})^{12} = \dots\dots\dots$

- a) $(\sqrt{2})^3$ b) 2^3 c) 2^4 d) 12

[Q2] Complete each of the following:

1) $x^2(x+1)(x-1) = (\dots\dots\dots - \dots\dots\dots)(x+1)$

2) $x^2 - 5x + 6 = (\dots\dots\dots - 3)(x - \dots\dots\dots)$

3) The probability of an impossible event = $\dots\dots\dots$

4) $x^3 + 8 = (\dots\dots + 2)(x^2 \dots\dots + 4)$

5) $\sqrt{2} \times (\sqrt{2})^2 \times (\sqrt{2})^3 = \dots\dots\dots$ in the simplest form

[Q3]

- A)** In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3. If the number of matches supposed to be played by that team is 30 matches.
How many matches do you predict the team loses?
- _____

- B)** The solution set of : $2x^2 - 5x = 3$ in \mathbb{R} is
- _____

[Q4]

- A)** Find in the simplest form : $\frac{2^{2n+1} \times 5^{2n+1}}{10^{2n}}$
- _____

- B)** If : $(9)^{x+3} = 3^{x+5}$, then find the value of x ?
- _____

[Q5] Factorize completely each of the following:

① $5x^2 - 3x - 2$

③ $a^2 - b^2c^4$

② $64x^4 + n^4$

④ $x^2 - 2xy + y^2 - z^2$



End of the questions

ALGEBRA – MODEL No 3**[Q1] Choose the correct answer:**

(1) If : $a^2 - b^2 = 16$, $b - a = 2$, then $a + b = \dots\dots\dots$

- a) 4 b) -8 c) 8 d) 2

(2) If : $\sqrt{x+5} = 3$ then $\sqrt{x} = \dots\dots\dots$

- a) 0 b) 2 c) 4 d) 9

(3) The S S of : $x^2 + 4 = 0$ in R is $\dots\dots\dots$

- a) $\{-4\}$ b) $\{-2, 2\}$ c) $\{-4, 4\}$ d) ϕ

(4) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$

- a) 6^2 b) 6^{11} c) 6^4 d) 6^{23}

(5) If : $4x^2 + 12x + a$ is perfect square then $a = \dots\dots\dots$

- a) 6 b) 16 c) 1 d) 9

(6) If : $4^5 = 5$, then $4^{x-1} = \dots\dots\dots$

- a) 1.25 b) 0.125 c) 0.8 d) 0.08

[Q2] Complete each of the following:

1) If : $5^{x+3} = 7^{x+5}$, then $x = \dots\dots\dots$

2) $(5x - 2y) = (25x^2 + 10xy + y^2) = \dots\dots\dots$

3) If : $x = (\sqrt{2} + 3)^5$, $y = (\sqrt{2} - 3)^5$, then $xy = \dots\dots\dots$

4) In a mixed school there are 300 pupils , the probability of selecting perfect student is a boy 0.6 , then the number of girls is $\dots\dots\dots$

5) If : $a^2 + 2ab + b^2 = 25$, then $a + b = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) $4a^4 - 9a^2 + 6a - 1$ ② $49x^2 - 25$

B) What is the real number which its double exceeds its multiplicative inverse by 1 ?

[Q4]

A) find the solution set in \mathbb{R} : $(x - 4)^5 = 32$

B) If : $\left(\frac{3}{5}\right)^{x+2} = \frac{125}{27}$ then find the value of x ?

[Q5]

A) If : $3^x = 27$, $4^{x+y} = 1$, then find the value of x and y

B) A box contains 7 black balls , 8 red balls and 5 white balls. If we draw one ball randomly, find the probability of getting : red ball
blue ball black or white ball

End of the questions

ALGEBRA – MODEL No**4****[Q1] Choose the correct answer:**(1) The S.S. in $R : x^2 + 9 = 0$ is

- a) $\{-3\}$ b) $\{3\}$ c) $\{-3, 3\}$ d) \emptyset

(2) If : $a - b = 9$, $a + b = 15$, then $a^2 - b^2 = \dots\dots\dots$

- a) 81 b) 135 c) 144 d) 225

(3) If : $x^2 + 14x + b$ is perfect square then $b = \dots\dots\dots$

- a) 2 b) 7 c) 14 d) 49

(4) $\frac{4 \times 2^{-1}}{3^{-1}} = \dots\dots\dots$

- a) 6 b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) $\frac{1}{6}$

(5) If : 4 times a number is 48, then third of this number is

- a) 16 b) 12 c) 4 d) 8

(6) If : x is an odd number, then the next odd number is

- a) $X + 1$ b) $X + 2$ c) $X + 3$ d) $X + 4$

[Q2] Complete each of the following:1) If : $6^x = 7$, then $6^{x-2} = \dots\dots\dots$ 2) The solution set in $R : x^2 = 5x$ is3) Quarter of the number $2^{50} = 2 \dots\dots$ 4) If : $(x + 5)$ is one factor of : $x^3 + 125$ then the other factor is ...5) $1 \text{ L} = \dots\dots\dots \text{ cm}^3$.

[Q3]

A) Simplify : $\frac{4^{x+1} \times 9^{x-2}}{6^{2x}}$

B) Find the positive real number , if we add its twice to its square the result will be 35 ?

[Q4]

A) Factorize : $8y^3 + 1$ $x^2 - 10xy + 25y^2 - 36$

B) If : $8^{4x-1} = 32$, then find the value of x ?

[Q5]

A) Factorize : $4x^4 + 1$ $3x^2 + 7x + 2$

B) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3 .If the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team draw ?

How many matches do you predict the team loss ?

End of the questions

ALGEBRA – MODEL No**5****[Q1] Choose the correct answer:**

(1) If: $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then $k = \dots\dots\dots$

- a) $-6x$ b) $-3x$ c) $3x$ d) $6x$

(2) If: $x^2 + y^2 = 7$, $xy = 3$, $(x - y)^2 = \dots\dots\dots$

- a) -1 b) 1 c) ± 1 d) 10

(3) If: $x^3 y^{-3} = 8$, then $\frac{y}{x} = \dots\dots\dots$

- a) $\frac{1}{512}$ b) $\frac{1}{8}$ c) $\frac{1}{2}$ d) 2

(4) If: $3^x = 5$, then $27^x = \dots\dots\dots$

- a) 9 b) 25 c) 125 d) 729

(5) If: $(x - 1)$ is one factor of: $x^2 - 4x + 3$ then the other factor is ...

- a) $X + 3$ b) $X - 3$ c) $X + 1$ d) $X - 4$

(6) If: $x^2 + 4x + a$ is perfect square then $a = \dots\dots\dots$

- a) 3 b) 4 c) 8 d) 16

[Q2] Complete each of the following:

1) If: $x + y = 7$, $x^2 - y^2 = 35$, $y - x = \dots\dots\dots$

2) The probability of an impossible event = $\dots\dots\dots$

3) If: $2^x = 5$, $2^{-y} = 3$, $2^{x+y} = \dots\dots\dots$

4) complete in the same pattern: $1, 4, 9, 16, 25, \dots\dots\dots$

5) If: $(25)^2 - (15)^2 = 10x$, then $x = \dots\dots\dots$

[Q3]

A) prove that : $\frac{(\sqrt{2})^2 \times 2^{1-x} \times 12^{2x-1}}{8^x \times 9^x} = \frac{1}{3}$

B) Two consecutive odd numbers there sum is 130 . find the two numbers ?

[Q4]

A) Factorize: ① $x^2 - 7x + 12$ ② $4x^4 + y^4$


B) If : $\frac{7^x \times 6^x}{14^2} = 3^{2-m}$, then find the value of $x + m$?

[Q5]

A) Factorize : ① $x^4 - 8x$ ② $ax - ay + x - y$

B) A basket contains balls numbered from 1 to 15 . a ball is drawn randomly. Calculate the probability of drawing ball carrying :

- ① An even number
- ② A number divisible by 3
- ③ A prim number


End of the questions

ALGEBRA – MODEL No 6**6****[Q1] Choose the correct answer:**

(1) If $x^2 - y^2 = 24$, $x + y = 8$, then $x - y = \dots$

- a) 3 b) 4 c) 18 d) 30

(2) If $(x - y)^0 = 1$, then $x \in \dots$

- a) $\mathbb{R} - \{5\}$ b) $\mathbb{R} - \{-5\}$ c) $\{5\}$ d) \mathbb{R}

(3) The solution set of : $x^2 = 4x$ is where $x \in \mathbb{Q}$

- a) $\{4\}$ b) $\{0\}$ c) $\{0, 4\}$ d) ϕ

(4) The probability of sure event =

- a) 0 b) 1 c) -1 d) $\frac{1}{2}$

(5) If $x^3 - a = (x - 4)(x^2 + 4x + 16)$, then $a = \dots$

- a) 4 b) 8 c) 16 d) 64

(6) $4^3 + 4^3 + 4^3 + 4^3 = \dots$

- a) 4^3 b) 4^4 c) 4^{12} d) 4^{81}

[Q2] Complete each of the following:

1) If : $x^2 + 10x + k$ is perfect square then $k = \dots$

2) If $x^3 y^{-3} = 8$, then $\frac{x}{y} = \dots$

3) If $2^y \times 5^y = 100$, then $y = \dots$

4) If : $a - b = 7$, $a^2 + ab + b^2 = 9$, then $3a^3 - 3b^3 = \dots$

5) If $2^x = 3$, then $8^x = \dots$

[Q3] factorize completely each of the following :

① $5x^2 - 25$

② $x^2 - 3x - 28$

③ $8 - x^3$

④ $4x^2 - 12x + 9$

[Q4]

A) Find the perimeter of rectangle its area is 40cm^2 and its length is 3cm. more than its width?

B) find the value of x in each equation of the following :

$2^{x-5} = 3^{2x-10} \quad (x+1)^5 = 32$

[Q5]

A) find in the simplest form : $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find the value of the result when $x = 1$

B) A box contains 30 cards numbered from 1 to 30 . a card is drawn randomly. Calculate the probability of drawing card carrying :

① an odd

② A number divisible by 5

③ A number is perfect square

End of the questions

ALGEBRA – MODEL No 7**[Q1] Choose the correct answer:**(1) If $x - y = 2$, $x + y = 7$, then $x^2 - y^2 = \dots\dots\dots$

- a) 9 b) 14 c) 28 d) 98

(2) If: $9x^2 - kx + 4$ is perfect square then $k = \dots\dots\dots$

- a) 6 b) 12 c) 36 d) 72

(3) If $6^x = 11$, then $6^{x+1} = \dots\dots\dots$

- a) 12 b) 22 c) 66 d) 72

(4) The solution set of: $x^2 + 1 = 0$ in R is $\dots\dots\dots$

- a)
- $\{1\}$
- b)
- $\{-1\}$
- c)
- $\{1, -1\}$
- d)
- ϕ

(5) If $(2x + 1)$ is factor of $2x^2 + 3x + 1$, then the other factor is ...

- a)
- $2x - 1$
- b)
- $x - 1$
- c)
- $x + 1$
- d)
- $x + 2$

(6) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$

- a)
- 6^2
- b)
- 6^4
- c)
- 6^{11}
- d)
- 6^{23}

[Q2] Complete each of the following:1) If tossing a fair die once, and observing the number on upper face, then the probability of getting a prime number = $\dots\dots\dots$ 2) If $x^4 y^{-4} = 16$, then $\frac{x}{y} = \dots\dots\dots$ 3) If $2^x = 15$, $2^y = 15$ then $2^{x-y} = \dots\dots\dots$ 4) If: $x + y = 8$, $x^3 + y^3 = 24$, then $x^2 - xy + y^2 = \dots\dots\dots$ 5) If the probability that a pupil succeed is 0.4 then the probability of his failure = $\dots\dots\dots$

[Q3] factorize completely each of the following :

① $xy - 5y + 6x - 30$ ② $x^2 + 7x + 6$

③ $x^3 - 125$ ④ $9x^2 - 16$

[Q4]

A) A positive integer , its square is more than its 3 times by 40 , find the number ?

B) If $x + x^{-1} = \sqrt{5}$, then find the value of : $x^2 + x^{-2}$ $x^3 + x^{-3}$

[Q5]

A) If $\frac{8^x \times 9^x}{18^x} = 64$, then find the value of 4^{-x}

B) In a football league, the probability of a team to win is 0.7 and the probability of a draw is 0.2 .if the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team wins ?

How many matches do you predict the team loses ?

End of the questions

ALGEBRA — MODEL No**8****[Q1] Choose the correct answer:**

(1) $3^x + 3^x + 3^x = \dots\dots$

- a) 3^{2x} b) 3^{x+1} c) 3^x d) 9^{x+1}

(2) If: $x^2 + kx + 36$ is perfect square then $k = \dots\dots\dots$

- a) ± 6 b) ± 8 c) ± 12 d) ± 18

(3) If: $x^2 + 14x + k$ can be factorize, then $k = \dots\dots\dots$

- a) 2 b) 7 c) 14 d) 49

(4) If $2^x = 3$, $3^y = 2$, then $xy = \dots\dots\dots$

- a) 1 b) 2 c) 3 d) 6

(5) The solution set of: $x^2 = 9^0$ in R is $\dots\dots\dots$

- a) $\{-3, 3\}$ b) $\{1\}$ c) $\{-1\}$ d) $\{1, -1\}$

(6) If $a-b = 3$, $x-y = 5$, then $a(x-y) + b(x-y) = \dots\dots\dots$

- a) 8 b) 15 c) -8 d) -15

[Q2] Complete each of the following:

1) If chosen a digit from a number 37542, then the probability of getting an even number = $\dots\dots\dots$

2) If $2^{x-5} = (\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})$, then $x^2 = \dots\dots\dots$

3) A quarter of the number $(\sqrt{2})^{12} = \dots\dots\dots$

4) If: $x + y = 3$, $x^2 - y^2 = 12$, then $x - y = \dots\dots\dots$

5) The probability of the impossible event = $\dots\dots\dots$

[Q3] factorize completely each of the following :

A) $8x^3 + 27 \quad 2x^2 - 18$

B) $x^2 + 7x + 12 \quad ab - 3b + 5a - 15$

[Q4]

A) A positive integer , if we add its square to its 3 times the result will be 18 , what is the number ?

B) Use factorization to get the value of each of the following easily:

$$(0.6)^2 - 1.2 \times 10.6 + (10.6)^2 \quad 98 \times 102$$

[Q5]

A) prove that : $\frac{27^{x-1} \times 8^x}{(2\sqrt{2})^{2x} \times (3\sqrt{3})^{2x}} = \frac{1}{27}$

B) A class has 40 students, 30 students of them succeed in math , 24 students of them succeed in science , if one of them is chosen randomly from this class , find the probability that the student :
succeed in math failure in science

End of the questions

ALGEBRA – MODEL No 9**[Q1] Choose the correct answer:**

(1) $3x^0 = \dots\dots\dots$, where $x \neq 0$

- a) 0 b) 1 c) 3 d) $3x$

(2) If $x^2 - 5xy + 6y^2 = 10$, $x - 2y = 5$, then $x - 3y = ..$

- a) 2 b) 7 c) 14 d) 49

(3) $2^{20} + 2^{21} = \dots\dots\dots$

- a) 2×2^{40} b) 2×2^{41} c) 3×2^{20} d) 3×2^{21}

(4) If : $kx^2 + 6x - 27$ can be factorize , then $k = \dots\dots\dots$

- a) 6 b) 3 c) 9 d) 5

(5) If $x = 5$ is solution of $x^2 - 6x + n$, then $n = \dots\dots\dots$

- a) 5 b) -5 c) 4 d) -4

(6) $(5^{x+2} - 5^{x+1}) \div 5^x = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 20

[Q2] Complete each of the following:

1) If $k^2 + m^2 = 21$, $mk = 3$, then $(k + m)^2 = \dots\dots\dots$

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is

3) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots$

4) If : $kx^2 + 20x + 25$ is perfect square , then $k = \dots\dots\dots$

5) If $x + y = 5$, $a + b = 3$ then $ax + xb + ay + yb = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) $x^3 - 8$

$$9x^4 - 36y^4$$

B) $2x^2 + 10xy + 2y^2$

$$x^2 - y^2 + 5x + 5y$$

[Q4]


A) Two real numbers, the difference between them is 2 and the sum of their squares is 74 . Find the two numbers ?

B) Use factorization to get the value of each of the following easily: $2 \times (26.18)^2 - 2 \times (23.82)^2$

[Q5]

A) If $3^{x+1} = 81$, $4^{x+y} = 1$, then find the value of x and y ?

B) A numbered cards is selected randomly from a set of similar cards numbered from 1 to 24 , Find the probability of getting a card that carries : A multiple of 6 A number is perfect square


End of the questions

ALGEBRA – MODEL No**10****[Q1] Choose the correct answer:**

(1) If $x^2 - m = (x - 7)(x + 7)$, then $m = \dots\dots\dots$

- a) 7 b) -7 c) 49 d) -49

(2) 1) If: $x^3 + y^3 = 15$, $x + y = 3$, then $x^2 - xy + y^2 = \dots$

- a) 3 b) 5 c) 15 d) 45

(3) If $x = 2$ is solution of $x^2 - 6x + k$, then $k = \dots\dots\dots$

- a) 8 b) -8 c) 4 d) -4

(4) If $2^x = 3$, $3^y = 16$, then $xy = \dots\dots\dots$

- a) 2 b) 4 c) -2 d) -4

(5) If: $x^2 + 7x + n$ can be factorize, then $n = \dots\dots\dots$

- a) 8 b) 10 c) 18 d) 49

(6) If: $0.05 \times 0.02 = 10^x$ then $x = \dots\dots\dots$

- a) -4 b) 0 c) 2 d) 4

[Q2] Complete each of the following:

1) If $x^2 + ax + 25$ is perfect square, then $a = \dots\dots\dots$

2) The S.S: $x(x - 3) = 5x$ in R is $\dots\dots\dots$

3) If $2x^2 - 3x - 35 = (2x + m)(x - 5)$, then $m = \dots\dots\dots$

4) $(x - 3)^0 = 1$ where $x \neq \dots\dots$

5) If $(\frac{1}{2})^x = 5$ then $8^{-x} = \dots\dots\dots$

[Q3] Factorize completely each of the following :

① $25x^2 - 49$

③ $x^2 - 8x + 12$

② $2x^3 + 250$

④ $ab + 4b + 5a + 20$

[Q4]

A) Find the length and width of rectangle its area is 40cm^2 and its length is 3cm. more than its width?

B) find the value of x in each equation of the following :

① $(\sqrt{3})^{x-1} = 9$

② $5^{x-1} \times 7^{1-x} = 1$

[Q5]

A) If $\frac{49^x \times 25^{2x} \times 3^{4x}}{(\sqrt{49})^{-x} \times (15)^{4x}} = 343$, then find the value of : 6^{2x}

B) in the experiment of composing 2-digit different number from the digits $\{1, 2, 3, 4\}$. find the sample space then Find the probability of getting :

① a number its tens is even

② a number both units and tens are even

End of the questions

ALGEBRA — MODEL No

1

[Q1] Choose the correct answer:(1) If $x^2 + 10x + k$ is perfect square, then $k = \dots\dots\dots$

- a) 100 ~~b) 25~~ c) 20 d) 10

(2) The solution set of: $3x^2 = 3x$ in \mathbb{R} is $\dots\dots\dots$

- a) $\{3, -1\}$ b) $\{-3, 1\}$ ~~c) $\{0, 1\}$~~ d) $\{1, 3\}$

(3) If $3^x = 5$, $3^y = 7$, then $3^{x+y} = \dots\dots\dots$

- a) 12 b) 15 c) 21 ~~d) 35~~

(4) If: $x^2 + ax - 12$ can be factorize, then $a = \dots\dots\dots$

- a) 7 b) 8 ~~c) 4~~ d) 13

(5) Which of the following is true ($x \in \mathbb{R}$)

- ~~a) $9^x > 0$~~ b) $x + 9 > 0$ c) $x^9 > 0$ d) $9x > 0$

(6) If the age of a man now is x year, then his age after 5 years is ...

- ~~a) $X + 5$~~ b) $X - 5$ c) $5x$ d) x

[Q2] Complete each of the following:1) If: $k^2 + m^2 = 21$, $km = 3$, then $k + m = \pm 3\sqrt{3}$

$$\begin{aligned} (k+m)^2 &= k^2 + 2km + m^2 \\ k^2 + 2km + m^2 &= 21 + 2(3) = 27 \\ \sqrt{k+m} &= \sqrt{27} \\ k+m &= 3\sqrt{3} \end{aligned}$$

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is $(5x - 7)$

$$6^{12} = 6^1 = 6^{11}$$

3) If Sixth of the number $(2^{12} \times 3^{12}) = 6^k$, then $k = \dots\dots\dots$ 4) The S.S: $x^3 + 25x = 0$ in \mathbb{R} is $\{0\}$ 5) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots$

$$3^x(1+1+1) = 3^x \times 3 = 1$$

[Q3] factorize completely each of the following :

A) ① $x^6 - 7x^3 - 8$

$(x^3 - 8)(x^3 + 1)$

$(x-2)(x^2+2x+4)(x+1)(x^2-x+1)$

② $16x^2 - a^2 + 6ax - 9x^2$

$16x^2 - (a^2 + 6ax - 9x^2)$

$16x^2 - (a - 3x)^2$

$(4x - a + 3x)(4x + a - 3x)$

$(7x - a)(x + a)$

B) Use factorization to get the value of each of the following easily:

① $(14.06)^2 - 8.12 \times 14.06 + (4.06)^2$

$14.06(14.06 - 8.12 + 4.06)$

$14.06 \times 20 = 281.2$

② $(998)^2 - 4$

$(998+2)(998-2)$

$1000 \times 996 = 996000$

[Q4]

A) Find real number that its twice exceed to its multiplicative inverse

by 1? $2x - \frac{1}{x} = 1$

$2x$

$\div \frac{1}{x}$

$2x^2 - 1 = x$

$2x^2 - x - 1 = 0$

$(2x+1)(x-1) = 0$

$\frac{1}{x}$

$2x = -\frac{1}{x}$

or $x = 1$

B) find the value of x in each of the following :

① $3^{x-1} = 27$

$3^{x-1} = 3^3$

$x-1 = 3$

② $3^{x-3} = 2^{2x-6}$

$x-3=0$

$x=3$

$2x-6=0$

$x=3$

[Q5] A) If $\frac{8^x \times 3^{2x}}{18^x} = 64$, then find the value of 4^{-x}

$\frac{1}{64} = 4^{-3}$

$\Rightarrow 2x=6$

$x=3$

$2^x \times 2^x \times 3^{2x} \times 3^{2x} = 64$

$2^x \times 2^x \times 3^{2x} = 64$

$2^{2x} = 64$

$2^{2x} = 2^6$

B) A box contains 40 cards numbered from 1 to 40. a card is drawn randomly. Calculate the probability of drawing card carrying :

① An even number

② A number divisible by 5 $\frac{8}{40} = \frac{1}{5}$

③ A number is perfect square $\frac{6}{40} = \frac{3}{20}$

④ A prim number less than 18

$\frac{7}{40}$

End of the questions

ALGEBRA – MODEL No

2

[Q1] Choose the correct answer:(1) If $x^2 - kx + 25$ is perfect square then $k = \dots\dots\dots$

a) 5

b) 25

c) ± 10 d) ± 5 (2) $4^3 + 4^3 + 4^3 + 4^3 = \dots\dots\dots$

a)

 4^4

b)

 $(16)^3$

c)

 4^{12}

d)

 4^{81} (3) If $x = \frac{\sqrt{9}}{\sqrt{3}}$, then $x^{-1} = \dots\dots\dots$

a)

 $\sqrt{3}$

b)

2

c)

 $\frac{\sqrt{3}}{\sqrt{2}}$

d)

 $\frac{\sqrt{3}}{3}$ (4) If $k - m = 9$, $k + m = 15$ then $k^2 - m^2 = \dots\dots\dots$

a) 135

b) 9

c) 150

d)

 $\frac{3}{5}$ (5) $2^0 + 2^{-1} - \left(\frac{-1}{\sqrt{2}}\right)^2 = \dots\dots\dots$

a) 2

b) 0

c) 1

d)

-1

(6) Quarter of $(\sqrt{2})^{12} = \dots\dots\dots$

a)

 $(\sqrt{2})^3$

b)

 2^3

c)

 2^4

d)

12

[Q2] Complete each of the following:

1) $x^2(x+1)(x-1) = (\dots\dots\dots - \dots\dots\dots)(x+1)$

2) $x^2 - 5x + 6 = (\dots\dots\dots - 3)(x - \dots\dots\dots)$

3) The probability of an impossible event = $\dots\dots\dots$

4) $x^3 + 8 = (\dots\dots\dots + 2)(x^2 - \dots\dots\dots + 4)$

5) $\sqrt{2} \times (\sqrt{2})^2 \times (\sqrt{2})^3 = \dots\dots\dots$ in the simplest form

[Q3]

- A) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3. If the number of matches supposed to be played by that team is 30 matches. $1 - (0.6 + 0.3) = 0.1$
How many matches do you predict the team loses? $0.1 \times 30 = 3$ matches

- B) The solution set of: $2x^2 - 5x = 3$ in \mathbb{R} is $\left\{-\frac{1}{2}, 3\right\}$

$$2x^2 - 5x - 3 = 0$$

$$x^2 - 5x - 6 = 0$$

$$(x-6)(x+1) = 0$$

$$(x-6)(x+1) = 0$$

$$x = -1$$

$$x = 3$$

[Q4]

- A) Find in the simplest form: $\frac{2^{2n+1} \times 5^{2n+1}}{10^{2n}}$

$$\frac{2^{2n+1} \times 5^{2n+1}}{2^{2n} \times 5^{2n}} = 2 \times 5 = 10$$

- B) If: $(9)^{x+3} = 3^{x+5}$, then find the value of x : $x = -1$

[Q5] Factorize completely each of the following:

① $5x^2 - 3x - 2$

③ $a^2 - b^2c^4$

② $64x^4 + n^4$

④ $x^2 - 2xy + y^2 - z^2$

① $5x^2 - 3x - 2$
 $x^2 - 3x - 10$
 $(x-5)(x+2)$
 $(x-1)(5x+2)$

End of the questions

③ $(a-bc)(a+bc)$

④ $(x-y)(x-y) - z^2$

$(x-y)^2 - z^2$

$(x-y+z)(x-y-z)$

② $(64x^4 + 16x^2n^2 + n^4) - 16x^2n^2$
 $(8x^2 + n^2)^2 - (4xn)^2$
 $(8x^2 + n^2 + 4xn)(8x^2 + n^2 - 4xn)$

ALGEBRA — MODEL No

3

[Q1] Choose the correct answer:(1) If: $a^2 - b^2 = 16$, $b - a = 2$, then $a + b = \dots\dots\dots$

- a) 4 b) -8 c) 8 d) 2

(2) If: $\sqrt{x+5} = 3$ then $\sqrt{x} = \dots\dots\dots$

- a) 0 b) 2 c) 4 d) 9

(3) The S S of: $x^2 + 4 = 0$ in R is $\dots\dots\dots$

- a) $\{-4\}$ b) $\{-2, 2\}$ c) $\{-4, 4\}$ d) ϕ

(4) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$

- a) 6^2 b) 6^{11} c) 6^4 d) 6^{23}

(5) If: $4x^2 + 12x + a$ is perfect square then $a = \dots\dots\dots$

- a) 6 b) 16 c) 1 d) 9

(6) If: $4^x = 5$, then $4^{x-1} = \dots\dots\dots$

- a) 1.25 b) 0.125 c) 0.8 d) 0.08

[Q2] Complete each of the following:1) If: $5^{x+3} = 7^{x+3}$, then $x = \dots\dots\dots$ 2) $(5x - 2y)^2 = (25x^2 + 10xy + y^2) = (5x + y)^2$ 3) If: $x = (\sqrt{2} + \sqrt{3})^5$, $y = (\sqrt{2} - \sqrt{3})^5$, then $xy = (2 - 3)^5 = -1$ 4) In a mixed school there are 300 pupils, the probability of selecting perfect student is a boy 0.6, then the number of girls is $\dots\dots\dots$
 $0.4 \times 300 = 120$ 5) If: $a^2 + 2ab + b^2 = 25$, then $a + b = \pm 5$
 $\sqrt{(a+b)^2} = \sqrt{25}$

[Q3] factorize completely each of the following : $(7x+5)(x-5)$

A) $4a^4 - (9a^2 + 6a - 1)$ ② $49x^2 - 25$

$$4a^2 - (3a+1)^2$$

$$(2a+3a+1)(2a-3a-1)$$

$$(5a+1)(-a-1)$$

B) What is the real number which its double exceeds its multiplicative inverse by 1?

$$2x - \frac{1}{x} = 1 \quad (\div x) \quad \left| \begin{array}{l} x^2 - 1 = x \\ x^2 - x - 1 = 0 \end{array} \right. \quad \left| \begin{array}{l} (x-\frac{1}{2})(x+\frac{1}{2}) = 0 \\ x-\frac{1}{2} = 0 \quad | 2x+1 = 0 \\ x = \frac{1}{2} \quad | x = -\frac{1}{2} \end{array} \right.$$

[Q4]

A) find the solution set in R : $(x-4)^5 = 32$ 2^5

$$x-4 = 2 \quad S.S = \{6\}$$

B) If: $\left(\frac{3}{5}\right)^{x+2} = \frac{125}{27}$ then find the value of x?

$$\left(\frac{5}{3}\right)^3 = \left(\frac{3}{5}\right)^{-3}$$

$$x+2 = -3$$

$$x = -5$$

[Q5]

A) If: $3^x = 27$, $4^{x+y} = 1$, then find the value of x and y

B) A box contains 7 black balls, 8 red balls and 5 white balls. If we

draw one ball randomly, find the probability of getting: red ball

blue ball black or white ball $\frac{12}{20} = \frac{3}{5}$

$$\frac{8}{20} = \frac{2}{5}$$

End of the questions

ALGEBRA — MODEL No

4

[Q1] Choose the correct answer:

(1) The S.S. in $R : x^2 + 9 = 0$ is

- a) $\{-3\}$ b) $\{3\}$ c) $\{-3, 3\}$ ~~d) \emptyset~~

(2) If: $a - b = 9$, $a + b = 15$, then $a^2 - b^2 = \dots\dots\dots$

- a) 81 ~~b) 135~~ c) 144 d) 225

(3) If: $x^2 + 14x + b$ is perfect square then $b = \dots\dots\dots$

- a) 2 b) 7 c) 14 ~~d) 49~~

(4) $\frac{4 \times 2^{-1}}{3^{-1}} = \dots\dots\dots$

- ~~a) 6~~ b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) $\frac{1}{6}$

(5) If: 4 times a number is 48, then third of this number is

- a) 16 b) 12 ~~c) 4~~ ~~d) 8~~

(6) If: x is an odd number, then the next odd number is

- a) $X + 1$ ~~b) $X + 2$~~ c) $X + 3$ d) $X + 4$

[Q2] Complete each of the following:

1) If: $6^x = 7$, then $6^{x-2} = \frac{7}{36}$ 2) The solution set in $R : x^2 = 5x$ is $\{0, 5\}$ 3) Quarter of the number $2^{50} = 2^{48}$ 4) If: $(x + 5)$ is one factor of: $x^3 + 125$ then the other factor is $(x^2 - 5x + 25)$ 5) $1 \text{ L} = 1000 \text{ cm}^3$

$$\frac{6^x}{6^2} = \frac{7}{36}$$

$$\begin{aligned} x^2 - 5x &= 0 \\ x(x-5) &= 0 \\ x=0 \quad | \quad x=5 \end{aligned}$$

$$\frac{2^{50}}{2^2} = 2^{48}$$

[Q3]

A) Simplify: $\frac{4^{x+1} \times 9^{x-2}}{6^{2x}}$

$$\frac{2^{2x+2} \times 3^{2x-4}}{2^{2x} \times 3^{2x}} = 2^2 \times 3^{-6} = \frac{2^2}{3^6} = \frac{4}{81}$$

B) Find the positive real number, if we add its twice to its square the result will be 35?

No. is $x \rightarrow 2x + x^2 = 35$ $x = -7$ $x = 5$
 $x^2 + 2x - 35 = 0$
 $(x+7)(x-5)$ $\therefore x = 5$

[Q4]

A) Factorize: $8y^3 + 1$

$$(2y+1)(4y^2-2y+1)$$

$$\begin{aligned} & (x-5y)^2 - (6)^2 \\ & (x-5y+6)(x-5y-6) \end{aligned}$$

B) If $2^{2x-3} = 32$, then find the value of x ?

$$\begin{aligned} 2^{2x-3} &= 2^5 \therefore x = \frac{8}{2} \\ 2x-3 &= 5 \\ 2x &= 8 \end{aligned}$$

[Q5]

A) Factorize: $4x^4 + 1$

$$(2x^2+1)(2x^2+1-2x)$$

$$\begin{aligned} & (4x^4 + 4x^2 + 1) - 4x^2 \\ & (2x^2+1)^2 - (2x)^2 \\ & (x+\frac{6}{3})(x+\frac{1}{3}) \\ & 3x^2 + 7x + 2 \quad (x+2)(3x+1) \end{aligned}$$

B) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3. If the number of matches supposed to be played by that team is 30 matches.

How many matches do you predict the team draw? $30 \times 0.3 = 9$

How many matches do you predict the team loss? $30 \times 0.1 = 3$

End of the questions

ALGEBRA — MODEL NO

5

[Q1] Choose the correct answer:

(1) If: $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then $k = \dots\dots\dots$

- a)
- $-6x$
- ~~b) $-3x$~~
- c)
- $3x$
- d)
- $6x$

(2) If: $x^2 + y^2 = 7$, $xy = 3$, $(x - y)^2 = \dots\dots\dots$

- a)
- -1
- ~~b) 1~~
- c)
- ± 1
- d)
- 10

(3) If: $x^3 y^{-3} = 8$, then $\frac{y}{x} = \dots\dots\dots$

- a)
- $\frac{1}{512}$
- b)
- $\frac{1}{8}$
- ~~c) $\frac{1}{2}$~~
- d)
- 2

(4) If: $3^x = 5$, then $27^x = \dots\dots\dots$

- a)
- 9
- b)
- 25
- ~~c) 125~~
- d)
- 729

(5) If: $(x - 1)$ is one factor of: $x^2 - 4x + 3$ then the other factor is ...

- a)
- $x + 3$
- ~~b) $x - 3$~~
- c)
- $x + 1$
- d)
- $x - 4$

(6) If: $x^2 + 4x + a$ is perfect square then $a = \dots\dots\dots$

- a)
- 3
- ~~b) 4~~
- c)
- 8
- d)
- 16

[Q2] Complete each of the following:

1) If: $x + y = 7$, $x^2 - y^2 = 35$, $y - x = \dots\dots\dots -5$

2) The probability of an impossible event = $\dots\dots\dots 0$

3) If: $2^x = 5$, $2^{-y} = 3$, $2^{x+y} = \dots\dots\dots \frac{5}{3}$ \div

4) complete in the same pattern: $1, 4, 9, 16, 25, \dots\dots\dots 36$

5) If: $(25)^2 - (15)^2 = 10x$, then $x = \dots\dots\dots 40$

[Q3]

A) prove that: $\frac{(\sqrt{2})^2 \times 2^{1-x} \times 12^{2x-1}}{8^x \times 9^x} = \boxed{\frac{1}{3}}$

$$2^x 2^{1-x} \times 2^{2x-1} \times 3^{2x-1} \times 3^{2x-1} \times 3^{2x-1}$$

$$2^x \times 2^1 \times 2^x \times 3^x \times 3^x \times 3^x$$

$$= 2^0 \times 3^{-1} = \boxed{\frac{1}{3}}$$

B) Two consecutive ~~odd~~ ^{even} numbers there sum is 130. find the two numbers? x and x+2

$$2x + 2 = 130$$

$$2x = 128$$

$$x = 64$$

64, 66

[Q4]

$$(x-4)(x-3)$$

A) Factorize: ① $x^2 - 7x + 12$

$$4x^4 + 4x^2y^2 + y^4 - 4x^2y^2$$

$$(2x^2 + y^2)^2 - (2xy)^2$$

$$(2x^2 + y^2 + 2xy)(2x^2 + y^2 - 2xy)$$

B) If: $\frac{7^x \times 6^x}{14^x} = 3^{2-m}$, then find the value of $x+m$?

$$\frac{7^x \times 2^x \times 3^x}{2^x \times 7^x} = 3^x = 3^{2-m} \quad \therefore x = 2-m \quad \therefore \boxed{x+m=2}$$

[Q5]

$$x(x^3 - 8)$$

$$x(x-2)(x^2 + 2x + 4)$$

A) Factorize: ① $x^4 - 8x$

$$ax + x - ay - y$$

$$x(a+1) - y(a+1)$$

$$(a+1)(x-y)$$

B) A basket contains balls numbered from 1 to 15. a ball is drawn randomly. Calculate the probability of drawing ball carrying:

① An even number $\frac{7}{15}$ ② A number divisible by 3 $\frac{5}{15} = \frac{1}{3}$ ③ A prim number $\frac{6}{15} = \frac{2}{5}$

End of the questions

ALGEBRA - MODEL No 6

[Q1] Choose the correct answer:

(1) If $x^2 - y^2 = 24$; $x + y = 8$, then $x - y = \dots$

- a) 3 b) 4 c) 18 d) 30

(2) If $(x - 5)^0 = 1$, then $x \in \dots$

- a) $\mathbb{R} - \{5\}$ b) $\mathbb{R} - \{-5\}$ c) $\{5\}$ d) \mathbb{R}

(3) The solution set of: $x^2 = 4x$ is where $x \in \mathbb{Q}$

- a) $\{4\}$ b) $\{0\}$ c) $\{0, 4\}$ d) ϕ

(4) The probability of sure event =

- a) 0 b) 1 c) -1 d) $\frac{1}{2}$

(5) If $x^3 - a = (x - 4)(x^2 + 4x + 16)$, then $a = \dots$

- a) 4 b) 8 c) 16 d) 64

(6) $4^3 + 4^3 + 4^3 + 4^3 = \dots$

- a) 4^3 b) 4^4 c) 4^{12} d) 4^{81}

[Q2] Complete each of the following:

1) If: $x^2 + 10x + k$ is perfect square then $k = \dots 25$ 2) If $x^3 y^{-3} = 8$, then $\frac{x}{y} = \dots 2$ 3) If $2^y \times 5^y = 100$, then $y = \dots 2$

$$10^y = 100 \quad y = 2$$

4) If: $a - b = 7$, $a^2 + ab + b^2 = 9$, then $3a^3 - 3b^3 = \dots 189$

$$3(a-b)(a^2 + ab + b^2)$$

$$3 \times 7 \times 9 = 189$$

5) If $2^x = 3$, then $8^x = \dots 27$

$$(2^3)^x = (2^x)^3 = 3^3 = 27$$

$$5x^2 - 125 = 5(x^2 - 25) = 5(x+5)(x-5)$$

[Q3] factorize completely each of the following :

① $5x^2 - 25$

$5(x^2 - 5)$

②

$x^2 - 3x - 28$

$(x+4)(x-7)$

③ $8 - x^3$

$(2-x)(4+2x+x^2)$

④

$4x^2 - 12x + 9$

$(2x-3)^2$

[Q4]

A) Find the perimeter of rectangle its area is 40cm^2 and its length is 3cm. more than its width?

$w = 5$

$L = 8$

$P = 26\text{cm}$

$w = x$

$L = x + 3$

$x(x+3) = 40$

$x^2 + 3x - 40 = 0$

$(x+8)(x-5)$

$x = -8$

$x = 5$

B) find the value of x in each equation of the following :

$2^{x-5} = 3^{2x-10}$

$x=5 = 2x-10$

$5 = x$

$(x+1)^2 = 32$

$x+1 = 2$

$x = 1$

[Q5]

A) find in the simplest form : $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find the value of the result when $x = 1$

$2^{2x+2} \times 3^{2-x} \times 3^{2-x}$

$2^{2x} \times 3^{2x}$

$4 \times 3^{4-4x} = 4 \times 3^0 = 4$

B) A box contains 30 cards numbered from 1 to 30 . a card is drawn randomly. Calculate the probability of drawing card carrying :

① an odd $\frac{1}{2}$

② A number divisible by 5 $\frac{6}{30} = \frac{1}{5}$

③ A number is perfect square $\frac{5}{30} = \frac{1}{6}$



End of the questions

ALGEBRA — MODEL No

7

[Q1] Choose the correct answer:(1) If $x - y = 2$, $x + y = 7$, then $x^2 - y^2 = \dots\dots\dots$

- a) 9 ~~b) 14~~ c) 28 d) 98

(2) If: $9x^2 - kx + 4$ is perfect square then $k = \dots\dots\dots$

- a) 6 ~~b) 12~~ c) 36 d) 72

(3) If $6^x = 11$, then $6^{x+1} = \dots\dots\dots$

- a) 12 b) 22 ~~c) 66~~ d) 72

(4) The solution set of: $x^2 + 1 = 0$ in \mathbb{R} is $\dots\dots\dots$

- a) $\{1\}$ b) $\{-1\}$ c) $\{1, -1\}$ ~~d) ϕ~~

(5) If $(2x + 1)$ is factor of $2x^2 + 3x + 1$, then the other factor is ...

- a) $2x - 1$ b) $x - 1$ ~~c) $x + 1$~~ d) $x + 2$

(6) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$

- a) 6^2 b) 6^4 ~~c) 6^{11}~~ d) 6^{23}

[Q2] Complete each of the following:

1) If tossing a fair die once, and observing the number on upper face, then the probability of getting a prime number = $\frac{1}{2}$

2) If $x^4 y^{-4} = 16$, then $\frac{x}{y} = \dots\dots\dots$

$$\left(\frac{x}{y}\right)^4 = 2^4 \quad 2$$

3) If $2^x = 15$, $2^y = 15$ then $2^{x-y} = \dots\dots\dots$

$$15 \div 15 = 1$$

4) If: $x + y = 8$, $x^3 + y^3 = 24$, then $x^2 - xy + y^2 = \dots\dots\dots$

5) If the probability that a pupil succeed is 0.4 then the probability of his failure = 0.6

[Q3] factorize completely each of the following :

① $xy - 5y + 6x - 30$ ② $x^2 + 7x + 6$ $(x+6)(x+1)$

③ $x^3 - 125$ ④ $9x^2 - 16$ $(3x-4)(3x+4)$
 $(x-5)(x^2+5x+25)$

[Q4]

A) A positive integer, its square is more than its 3 times by 40, find the number ?

$$x^2 - 3x = 40, \quad (x-8)(x+5) = 0$$

$$x^2 - 3x - 40 = 0 \quad \boxed{x=8} \quad x=-5 \alpha$$

B) If $x + x^{-1} = \sqrt{5}$, then find the value of : $x^2 + x^{-2} = 3$ $x^3 + x^{-3}$
 $(x+x^{-1})^2 = (\sqrt{5})^2$ $x^2 + x^{-2} = 3$

[Q5]

A) If $\frac{8^x \times 9^x}{18^x} = 64$, then find the value of 4^{-x} $\frac{1}{64}$

$$\left(\frac{8 \times 9}{18}\right)^x = (4)^x = 64$$

$$4^x = 4^3$$

$$x = 3$$

B) In a football league, the probability of a team to win is 0.7 and the probability of a draw is 0.2. if the number of matches supposed to be played by that team is 30 matches.

How many matches do you predict the team wins ? 21

How many matches do you predict the team loses ? 3

End of the questions

ALGEBRA — MODEL No

8

[Q1] Choose the correct answer:

(1) $3^x + 3^x + 3^x = \dots\dots$

- a) 3^{2x} ~~b) 3^{x+1}~~ c) 3^x d) 9^{x+1}

(2) If: $x^2 + kx + 36$ is perfect square then $k = \dots\dots\dots$

- a) ± 6 b) ± 8 ~~c) ± 12~~ d) ± 18

(3) If: $x^2 + 14x + k$ can be factorize, then $k = \dots\dots\dots$

- a) 2 b) 7 c) 14 ~~d) 49~~

(4) If $2^x = 3$, $3^y = 2$, then $xy = \dots\dots$

- ~~a) 1~~ b) 2 c) 3 d) 6

(5) The solution set of: $x^2 = 9^0$ in R is $\dots\dots\dots$

- a) $\{-3, 3\}$ b) $\{1\}$ c) $\{-1\}$ ~~d) $\{1, -1\}$~~

(6) If $a-b=3$, $x-y=5$, then $a(x-y) - b(x-y) = \dots\dots\dots$

- a) 8 ~~b) 15~~ c) -8 d) -15

[Q2] Complete each of the following:

1) If chosen a digit from a number 37542, then the probability of getting an even number = $\frac{2}{5}$

2) If $2^{x-5} = (\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})$, then $x^2 = 36$

3) A quarter of the number $(\sqrt{2})^{12} = 16$

4) If: $x+y=3$, $x^2 - y^2 = 12$, then $x-y = 4$

5) The probability of the impossible event = 0

[Q3] factorize completely each of the following :

A) $8x^3 + 27 \quad 2x^2 - 18$ $\frac{2(x^2-9)}{2(x-3)(x+3)}$

B) $x^2 + 7x + 12$ $(x+4)(x+3)$ $ab - 3b + 5a - 15$ $b(a-3) + 5(a-3) \rightarrow (b+5)(a-3)$

[Q4]

$x^2 + 3x - 18 = 0$ $x = -6$ $x = 3$
 $(x+6)(x-3) = 0$

A) A positive integer, if we add its square to its 3 times the result will be 18, what is the number?

B) Use factorization to get the value of each of the following easily:

$(0.6)^2 - 1.2 \times 10.6 + (10.6)^2$ 98×102 $(100-2)(100+2)$
 $10.6(10.6 - 1.2 + 10.6) = 10.6 \times 20 = 212$ $10000 - 4 = 9996$

[Q5]

A) prove that: $\frac{27^{x-1} \times 8^x}{(2\sqrt{2})^{2x} \times (3\sqrt{3})^{2x}} = \frac{1}{27}$

$\frac{3^{3x-3} \times 2^{3x}}{2^{2x} \times \sqrt{2}^{2x} \times 3^{2x} \times \sqrt{3}^{2x}}$
 $\frac{3^{3x-3} \times 2^{3x}}{2^{2x} \times 2^x \times 3^{2x} \times 3^x} = \frac{3^{-3} \times 2^0}{1} = \frac{1}{27}$

B) A class has 40 students, 30 students of them succeed in math, 24 students of them succeed in science, if one of them is chosen randomly from this class, find the probability that the student:

succeed in math failure in science $\frac{16}{40} = \frac{2}{5}$

$\frac{30}{40} = \frac{3}{4}$

End of the questions

ALGEBRA — MODEL No 9

[Q1] Choose the correct answer:

(1) $3x^0 = \dots\dots\dots$, where $x \neq 0$

- a) 0 b) 1 ~~c) 3~~ d) $3x$

(2) If $x^2 - 5xy + 6y^2 = 10$, $x - 2y = 5$, then $x - 3y = \dots$

- ~~a) 2~~ b) 7 c) 14 d) 49

(3) $2^{20} + 2^{21} = \dots\dots\dots$

- a) 2×2^{40} b) 2×2^{41} ~~c) 3×2^{20}~~ d) 3×2^{21}

(4) If: $kx^2 + 6x - 27$ can be factorize, then $k = \dots\dots\dots$

- a) 6 b) 3 c) 9 ~~d) 5~~

(5) If $x = 5$ is solution of $x^2 - 6x + n$, then $n = \dots\dots\dots$

- a) 5 b) -5 c) 4 ~~d) -4~~

(6) $(5^{x+2} - 5^{x+1}) \div 5^x = \dots\dots\dots$ $(5^x \times 5^2) - (5^x \times 5) = \frac{5^x(5^2 - 5)}{5^x} = 5$

- a) 5 b) 10 c) 15 ~~d) 20~~

[Q2] Complete each of the following:

1) If $k^2 + m^2 = 21$, $mk = 3$, then $(k + m)^2 = \dots\dots\dots 27$

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is $(5x - 7)$

3) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots -1$ $3^x(3) = 3^{x+1} = 1$
 $x+1=0$
 $x=-1$

4) If: $kx^2 + 20x + 25$ is perfect square, then $k = \dots\dots\dots 4$ $\frac{(m)^2}{4(3^{rd})}$

5) If $x + y = 5$, $a + b = 3$ then $ax + xb + ay + yb = \dots\dots\dots 15$
 $x(a+b) + y(a+b)$
 $(x+y)(a+b)$
 $5 \times 3 = 15$

[Q3] factorize completely each of the following:

A) $x^3 - 8$ $(x-2)(x^2+2x+4)$ $9x^4 - 36y^4$ $9(x^4 - 4y^4)$ $9(x^2+2y^2)(x^2-2y^2)$

B) $2x^2 + 10xy + 2y^2$ $2(x^2 + 5xy + y^2)$ $(x+y)(x-y) + 5(x+y)$ $(x+y)(x-y+5)$

[Q4] x $(x+2)$ $x^2 + (x+2)^2 = 74$ $2x^2 + 4x - 70 = 0$ $2(x^2 + 2x - 35) = 0$

A) Two real numbers, the difference between them is 2 and the sum of their squares is 74. Find the two numbers? $x = -7$ $x = 5$

B) Use factorization to get the value of each of the following easily: $2 \times (26.18)^2 - 2 \times (23.82)^2$ $2((26.18)^2 - (23.82)^2)$ $2(26.18+23.82)(26.18-23.82)$ $2 \times 50 \times 2.36 = 236$

[Q5] A $x+1=4$ $x=3$ $x+y=0$ $3+y=0$ $y=-3$

A) If $3^{x+1} = 81$, $4^{x+y} = 1$, then find the value of x and y ? $x=3$ $y=-3$

B) A numbered cards is selected randomly from a set of similar cards numbered from 1 to 24, Find the probability of getting a card that carries : A multiple of 6 A number is perfect square.

$\frac{4}{24} = \frac{1}{6}$ $\frac{4}{24} = \frac{1}{6}$

End of the questions

ALGEBRA — MODEL No

10

[Q1] Choose the correct answer:

- (1) If $x^2 - m = (x - 7)(x + 7)$, then $m = \dots\dots\dots$
 a) 7 b) -7 ~~c) 49~~ d) -49
- (2) 1) If: $x^3 + y^3 = 15$, $x + y = 3$, then $x^2 - xy + y^2 = \dots\dots\dots$
 a) 3 ~~b) 5~~ c) 15 d) 45
- (3) If $x = 2$ is solution of $x^2 - 6x + k$, then $k = \dots\dots\dots$
~~a) 8~~ b) -8 c) 4 d) -4
- (4) If $2^x = 3$, $3^y = 16$, then $xy = \dots\dots\dots$
 a) 2 ~~b) 4~~ c) -2 d) -4
- (5) If: $x^2 + 7x + n$ can be factorize, then $n = \dots\dots\dots$
 a) 8 ~~b) 10~~ c) 18 d) 49
- (6) If: $0.05 \times 0.02 = 10^x$ then $x = \dots\dots\dots$
 a) ~~3~~ ~~b) 0~~ c) 2 d) 4

[Q2] Complete each of the following:

- 1) If $x^2 + ax + 25$ is perfect square, then $a = \dots\dots\dots 10$.
- 2) The S.S: $x(x - 3) = 5x$ in R is $\{0, 8\}$
 $x^2 - 3x = 5x$
 $x^2 - 8x = 0$
 $x(x - 8) = 0$
- 3) If $2x^2 - 3x - 35 = (2x + m)(x - 5)$, then $m = \dots\dots\dots 7$.
- 4) $(x - 3)^0 = 1$ where $x \neq \dots\dots\dots 3$.
- 5) If $(\frac{1}{2})^x = 5$ then $8^{-x} = \dots\dots\dots 125$
 $(2^{-1})^x = 5$
 $2^{-x} = 5$
 $(2^3)^{-x} = (2^{-x})^3$
 $= (5)^3$
 $= 125$

[Q3] Factorize completely each of the following: $(x-6)(x-2)$

① $25x^2 - 49$ $(5x+7)(5x-7)$ ③ $x^2 - 8x + 12$

② $2x^3 + 250$ $2(x^3 + 125)$ ④ $ab + 4b + 5a + 20$
 $2(x+5)(x^2 - 5x + 25)$ $b(a+4) + 5(a+4)$

$(b+5)(a+4)$

[Q4]

A) Find the length and width of rectangle its area is 40cm^2 and its

length is 3cm. more than its width? $x^2 + 3x - 40 = 0$
 $(x+8)(x-5) = 0$
 $x = -8$ $x = 5$
 x

B) find the value of x in each equation of the following:

① $(\sqrt{3})^{x-1} = 9$
 $x-1 = 4$ $x = 5$

② $5^{x-1} \times 7^{1-x} = 1$

$x-1 = 0$
 $x = 1$
 $1-x = 0$
 $x = 1$

[Q5]

A) If $\frac{49^x \times 25^{2x} \times 3^{4x}}{(\sqrt{49})^{-x} \times (15)^{4x}} = 343$, then find the value of: 6^{2x} 3^{x-3}
 $6^{2x} = 36$ $x = 1$

B) in the experiment of composing 2-digit different number from the digits $\{1, 2, 3, 4\}$. find the sample space then Find the

probability of getting:

① a number its tens is even $\frac{1}{2}$

② a number both units and tens are even $\frac{1}{6}$

$S = \{12, 13, 14, 21, 23, 24, 31, 32, 34, 41, 42, 43\}$

$n(S) = 12$

(End of the questions

ALGEBRA – MODEL No

1

[Q1] Choose the correct answer:

(1) If $x^2 - y^2 = 24$, $x + y = 8$, then $x - y = \dots$

- a) 3 b) 4 c) 18 d) 30

(2) If $(x - y)^0 = 1$, then $x \in \dots$

- a) $R - \{5\}$ b) $R - \{-5\}$ c) $\{5\}$ d) R

(3) The solution set of: $x^2 = 4x$ is where $x \in Q$

- a) $\{4\}$ b) $\{0\}$ c) $\{0, 4\}$ d) ϕ

(4) The probability of sure event =

- a) 0 b) 1 c) -1 d) $\frac{1}{2}$

(5) If $x^3 - a = (x - 4)(x^2 + 4x + 16)$, then $a = \dots$

- a) 4 b) 8 c) 16 d) 64

(6) $4^3 + 4^3 + 4^3 + 4^3 = \dots$

- a) 4^3 b) 4^4 c) 4^{12} d) 4^{81}

[Q2] Complete each of the following:

1) If: $x^2 + 10x + k$ is perfect square then $k = \dots$

2) If $x^3 y^{-3} = 8$, then $\frac{x}{y} = \dots$

3) If $2^y \times 5^y = 100$, then $y = \dots$

4) If: $a - b = 7$, $a^2 + ab + b^2 = 9$, then $3a^3 - 3b^3 = \dots$

5) If $2^x = 3$, then $8^x = \dots$

[Q3] factorize completely each of the following :

① $5x^2 - 25$

② $x^2 - 3x - 28$

③ $8 - x^3$

④ $4x^2 - 12x + 9$

[Q4]

A) Find the perimeter of rectangle its area is 40cm^2 and its length is 3cm. more than its width?

B) find the value of x in each equation of the following :

$2^{x-5} = 3^{2x-10}$ $(x+1)^5 = 32$

[Q5]


A) find in the simplest form : $\frac{4^{x+1} \times 9^{2-x}}{6^{2x}}$, then find the value of the result when $x = 1$

B) A box contains 30 cards numbered from 1 to 30 . a card is drawn randomly. Calculate the probability of drawing card carrying :

① an odd

② A number divisible by 5

③ A number is perfect square


End of the questions

ALGEBRA – MODEL No 2**[Q1] Choose the correct answer:**

- (1) If $x - y = 2$, $x + y = 7$, then $x^2 - y^2 = \dots\dots\dots$
a) 9 b) 14 c) 28 d) 98
- (2) If: $9x^2 - kx + 4$ is perfect square then $k = \dots\dots\dots$
a) 6 b) 12 c) 36 d) 72
- (3) If $6^x = 11$, then $6^{x+1} = \dots\dots\dots$
a) 12 b) 22 c) 66 d) 72
- (4) The solution set of: $x^2 + 1 = 0$ in R is $\dots\dots\dots$
a) $\{1\}$ b) $\{-1\}$ c) $\{1, -1\}$ d) ϕ
- (5) If $(2x + 1)$ is factor of $2x^2 + 3x + 1$, then the other factor is ...
a) $2x - 1$ b) $x - 1$ c) $x + 1$ d) $x + 2$
- (6) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$
a) 6^2 b) 6^4 c) 6^{11} d) 6^{23}

[Q2] Complete each of the following:

- 1) If tossing a fair die once, and observing the number on upper face, then the probability of getting a prime number = $\dots\dots\dots$
- 2) If $x^4 y^{-4} = 16$, then $\frac{x}{y} = \dots\dots\dots$
- 3) If $2^x = 15$, $2^y = 15$ then $2^{x-y} = \dots\dots\dots$
- 4) If: $x + y = 8$, $x^3 + y^3 = 24$, then $x^2 - xy + y^2 = \dots$
- 5) If the probability that a pupil succeed is 0.4 then the probability of his failure = $\dots\dots\dots$

[Q3] factorize completely each of the following :

① $xy - 5y + 6x - 30$ ② $x^2 + 7x + 6$

③ $x^3 - 125$ ④ $9x^2 - 16$

[Q4]

A) A positive integer , its square is more than its 3 times by 40 , find the number ?

B) If $x + x^{-1} = \sqrt{5}$, then find the value of : $x^2 + x^{-2}$ $x^3 + x^{-3}$

[Q5]

A) If $\frac{8^x \times 9^x}{18^x} = 64$, then find the value of 4^{-x}

B) In a football league, the probability of a team to win is 0.7 and the probability of a draw is 0.2 .if the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team wins ?

How many matches do you predict the team loses ?

End of the questions

ALGEBRA — MODEL No

3

[Q1] Choose the correct answer:

- (1) $3^x + 3^x + 3^x = \dots\dots\dots$
 a) 3^{2x} b) 3^{x+1} c) 3^x d) 9^{x+1}
- (2) If: $x^2 + kx + 36$ is perfect square then $k = \dots\dots\dots$
 a) ± 6 b) ± 8 c) ± 12 d) ± 18
- (3) If: $x^2 + 14x + k$ can be factorize, then $k = \dots\dots\dots$
 a) 2 b) 7 c) 14 d) 49
- (4) If $2^x = 3$, $3^y = 2$, then $xy = \dots\dots\dots$
 a) 1 b) 2 c) 3 d) 6
- (5) The solution set of: $x^2 = 9^0$ in R is $\dots\dots\dots$
 a) $\{-3, 3\}$ b) $\{1\}$ c) $\{-1\}$ d) $\{1, -1\}$
- (6) If $a-b = 3$, $x-y = 5$, then $a(x-y) + b(x-y) = \dots\dots\dots$
 a) 8 b) 15 c) -8 d) -15

[Q2] Complete each of the following:

- If chosen a digit from a number 37542, then the probability of getting an even number = $\dots\dots\dots$
- If $2^{x-5} = (\sqrt{5} - \sqrt{3})(\sqrt{5} + \sqrt{3})$, then $x^2 = \dots\dots\dots$
- A quarter of the number $(\sqrt{2})^{12} = \dots\dots\dots$
- If: $x + y = 3$, $x^2 - y^2 = 12$, then $x - y = \dots\dots\dots$
- The probability of the impossible event = $\dots\dots\dots$

[Q3] factorize completely each of the following :

A) $8x^3 + 27$ $2x^2 - 18$

B) $x^2 + 7x + 12$

$ab - 3b + 5a - 15$

[Q4]

A) A positive integer , if we add its square to its 3 times the result will be 18 , what is the number ?

B) Use factorization to get the value of each of the following easily:

$(0.6)^2 - 1.2 \times 10.6 + (10.6)^2$

98×102

[Q5]

A) prove that : $\frac{27^{x-1} \times 8^x}{(2\sqrt{2})^{2x} \times (3\sqrt{3})^{2x}} = \frac{1}{27}$

B) A class has 40 students, 30 students of them succeed in math , 24 students of them succeed in science , if one of them is chosen randomly from this class , find the probability that the student :
succeed in math failure in science

End of the questions

ALGEBRA – MODEL No**4****[Q1] Choose the correct answer:**

(1) $3x^0 = \dots\dots\dots$, where $x \neq 0$

- a) 0 b) 1 c) 3 d)
- $3x$

(2) If $x^2 - 5xy + 6y^2 = 10$, $x - 2y = 5$, then $x - 3y = ..$

- a) 2 b) 7 c) 14 d) 49

(3) $2^{20} + 2^{21} = \dots\dots\dots$

- a)
- 2×2^{40}
- b)
- 2×2^{41}
- c)
- 3×2^{20}
- d)
- 3×2^{21}

(4) If : $kx^2 + 6x - 27$ can be factorize , then $k = \dots\dots\dots$

- a) 6 b) 3 c) 9 d) 5

(5) If $x = 5$ is solution of $x^2 - 6x + n$, then $n = \dots\dots\dots$

- a) 5 b) -5 c) 4 d) -4

(6) $(5^{x+2} - 5^{x+1}) \div 5^x = \dots\dots\dots$

- a) 5 b) 10 c) 15 d) 20

[Q2] Complete each of the following:

1) If $k^2 + m^2 = 21$, $mk = 3$, then $(k + m)^2 = \dots\dots\dots$

2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is

3) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots$

4) If : $kx^2 + 20x + 25$ is perfect square , then $k = \dots\dots\dots$

5) If $x + y = 5$, $a + b = 3$ then $ax + xb + ay + yb = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) $x^3 - 8$

$9x^4 - 36y^4$

B) $2x^2 + 10xy + 2y^2$

$x^2 - y^2 + 5x + 5y$

[Q4]

A) Two real numbers, the difference between them is 2 and the sum of their squares is 74. Find the two numbers ?

B) Use factorization to get the value of each of the following

easily: $2 \times (26.18)^2 - 2 \times (23.82)^2$

[Q5]

A) If $3^{x+1} = 81$, $4^{x+y} = 1$, then find the value of x and y ?

B) A numbered cards is selected randomly from a set of similar cards numbered from 1 to 24, Find the probability of getting a card that carries : A multiple of 6 A number is perfect square

End of the questions

ALGEBRA – MODEL No

5

[Q1] Choose the correct answer:(1) If $x^2 - m = (x - 7)(x + 7)$, then $m = \dots\dots\dots$

- a) 7 b) -7 c) 49 d) -49

(2) 1) If: $x^3 + y^3 = 15$, $x + y = 3$, then $x^2 - xy + y^2 = \dots\dots\dots$

- a) 3 b) 5 c) 15 d) 45

(3) If $x = 2$ is solution of $x^2 - 6x + k$, then $k = \dots\dots\dots$

- a) 8 b) -8 c) 4 d) -4

(4) If $2^x = 3$, $3^y = 16$, then $xy = \dots\dots\dots$

- a) 2 b) 4 c) -2 d) -4

(5) If: $x^2 + 7x + n$ can be factorize, then $n = \dots\dots\dots$

- a) 8 b) 10 c) 18 d) 49

(6) If: $0.05 \times 0.02 = 10^x$ then $x = \dots\dots\dots$

- a) -4 b) 0 c) 2 d) 4

[Q2] Complete each of the following:1) If $x^2 + ax + 25$ is perfect square, then $a = \dots\dots\dots$ 2) The S.S : $x(x - 3) = 5x$ in R is $\dots\dots\dots$ 3) If $2x^2 - 3x - 35 = (2x + m)(x - 5)$, then $m = \dots\dots\dots$ 4) $(x - 3)^0 = 1$ where $x \neq \dots\dots\dots$ 5) If $(\frac{1}{2})^x = 5$ then $8^{-x} = \dots\dots\dots$

[Q3] Factorize completely each of the following :

① $25x^2 - 49$

③ $x^2 - 8x + 12$

② $2x^3 + 250$

④ $ab + 4b + 5a + 20$

[Q4]

A) Find the length and width of rectangle its area is 40cm^2 and its length is 3cm. more than its width?

B) find the value of x in each equation of the following :

① $(\sqrt{3})^{x-1} = 9$

② $5^{x-1} \times 7^{1-x} = 1$

[Q5]

A) If $\frac{49^x \times 25^{2x} \times 3^{4x}}{(\sqrt{49})^{-x} \times (15)^{4x}} = 343$, then find the value of : 6^{2x}

B) in the experiment of composing 2-digit different number from the digits $\{1, 2, 3, 4\}$. find the sample space then Find the probability of getting :

① a number its tens is even

② a number both units and tens are even

End of the questions

ALGEBRA – MODEL No**6****[Q1] Choose the correct answer:**(1) If $x^2 + 10x + k$ is perfect square, then $k = \dots\dots\dots$

- a) 100 b) 25 c) 20 d) 10

(2) The solution set of : $3x^2 = 3x$ in R is $\dots\dots\dots$

- a) $\{3, -1\}$ b) $\{-3, 1\}$ c) $\{0, 1\}$ d) $\{1, 3\}$

(3) If $3^x = 5$, $3^y = 7$, then $3^{x+y} = \dots\dots\dots$

- a) 12 b) 15 c) 21 d) 35

(4) If : $x^2 + ax - 12$ can be factorize, then $a = \dots\dots\dots$

- a) 7 b) 8 c) 4 d) 13

(5) Which of the following is true ($x \in R$)

- a) $9^x > 0$ b) $x + 9 > 0$ c) $x^9 > 0$ d) $9x > 0$

(6) If the age of a man now is x year, then his age after 5 years is

- a) $X + 5$ b) $X - 5$ c) $5x$ d) x

[Q2] Complete each of the following:1) If : $k^2 + m^2 = 21$, $km = 3$, then $k + m = \dots\dots\dots$ 2) If $(x + 1)$ is factor of $5x^2 - 2x - 7$, then the other factor is $\dots\dots\dots$ 3) If Sixth of the number $(2^{12} \times 3^{12}) = 6^k$, then $k = \dots\dots\dots$ 4) The S.S : $x^3 + 25x = 0$ in R is $\dots\dots\dots$ 5) If $3^x + 3^x + 3^x = 1$, then $x = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) ① $x^6 - 7x^3 - 8$ ② $16x^2 - a^2 + 6ax - 9x^2$

B) Use factorization to get the value of each of the following easily:

① $(14.06)^2 - 8.12 \times 14.06 + (4.06)^2$ ② $(998)^2 - 4$

[Q4]

A) Find real number that its twice exceed to its multiplicative inverse by 1?

B) find the value of x in each of the following :

① $3^{x-1} = 27$ ② $3^{x-3} = 2^{2x-6}$

[Q5] A) If $\frac{8^x \times 3^{2x}}{18^x} = 64$, then find the value of 4^{-x}

B) A box contains 40 cards numbered from 1 to 40. a card is drawn randomly. Calculate the probability of drawing card carrying :

- ① An even number
- ② A number divisible by 5
- ③ A number is perfect square
- ④ A prim number less than 18



End of the questions

ALGEBRA — MODEL No 7**[Q1] Choose the correct answer:**(1) If : $x^2 - kx + 25$ is perfect square then $k = \dots\dots\dots$

- a) 5 b) 25 c) ± 10 d) ± 5

(2) $4^3 + 4^3 + 4^3 + 4^3 = \dots\dots\dots$

- a) 4^4 b) $(16)^3$ c) 4^{12} d) 4^{81}

(3) If $x = \frac{\sqrt{9}}{\sqrt{3}}$, then $x^{-1} = \dots\dots\dots$

- a) $\sqrt{3}$ b) 2 c) $\frac{\sqrt{3}}{\sqrt{2}}$ d) $\frac{\sqrt{3}}{3}$

(4) If : $k - m = 9$, $k + m = 15$ then $k^2 - m^2 = \dots\dots\dots$

- a) 135 b) 9 c) 150 d) $\frac{3}{5}$

(5) $2^0 + 2^{-1} - \left(\frac{-1}{\sqrt{2}}\right)^2 = \dots\dots\dots$

- a) 2 b) 0 c) 1 d) -1

(6) Quarter of $(\sqrt{2})^{12} = \dots\dots\dots$

- a) $(\sqrt{2})^3$ b) 2^3 c) 2^4 d) 12

[Q2] Complete each of the following:

1) $x^2(x+1)(x-1) = (\dots\dots\dots - \dots\dots\dots)(x+1)$

2) $x^2 - 5x + 6 = (\dots\dots\dots - 3)(x - \dots\dots\dots)$

3) The probability of an impossible event = $\dots\dots\dots$

4) $x^3 + 8 = (\dots\dots + 2)(x^2 \dots\dots + 4)$

5) $\sqrt{2} \times (\sqrt{2})^2 \times (\sqrt{2})^3 = \dots\dots\dots$ in the simplest form

[Q3]

- A) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3. If the number of matches supposed to be played by that team is 30 matches. How many matches do you predict the team loses?
- _____

- B) The solution set of: $2x^2 - 5x = 3$ in \mathbb{R} is
- _____

[Q4]

- A) Find in the simplest form: $\frac{2^{2n+1} \times 5^{2n+1}}{10^{2n}}$
- _____

- B) If: $(9)^{x+3} = 3^{x+5}$, then find the value of x ?
- _____

[Q5] Factorize completely each of the following:

① $5x^2 - 3x - 2$

③ $a^2 - b^2c^4$

② $64x^4 + n^4$

④ $x^2 - 2xy + y^2 - z^2$

End of the questions

ALGEBRA — MODEL No

8

[Q1] Choose the correct answer:(1) If: $a^2 - b^2 = 16$, $b - a = 2$, then $a + b = \dots\dots\dots$

- a) 4 b) -8 c) 8 d) 2

(2) If: $\sqrt{x+5} = 3$ then $\sqrt{x} = \dots\dots\dots$

- a) 0 b) 2 c) 4 d) 9

(3) The S S of: $x^2 + 4 = 0$ in R is $\dots\dots\dots$

- a) $\{-4\}$ b) $\{-2, 2\}$ c) $\{-4, 4\}$ d) ϕ

(4) Sixth of the number $(2^{12} \times 3^{12}) = \dots\dots\dots$

- a) 6^2 b) 6^{11} c) 6^4 d) 6^{23}

(5) If: $4x^2 + 12x + a$ is perfect square then $a = \dots\dots\dots$

- a) 6 b) 16 c) 1 d) 9

(6) If: $4^5 = 5$, then $4^{x-1} = \dots\dots\dots$

- a) 1.25 b) 0.125 c) 0.8 d) 0.08

[Q2] Complete each of the following:1) If: $5^{x+3} = 7^{x+5}$, then $x = \dots\dots\dots$ 2) $(5x - 2y) = (25x^2 + 10xy + y^2) = \dots\dots\dots$ 3) If: $x = (\sqrt{2} + 3)^5$, $y = (\sqrt{2} - 3)^5$, then $xy = \dots\dots\dots$

4) In a mixed school there are 300 pupils, the probability of selecting perfect student is a boy 0.6, then the number of girls is $\dots\dots\dots$

5) If: $a^2 + 2ab + b^2 = 25$, then $a + b = \dots\dots\dots$

[Q3] factorize completely each of the following :

A) $4a^4 - 9a^2 + 6a - 1$ ② $49x^2 - 25$

B) What is the real number which its double exceeds its multiplicative inverse by 1 ?

[Q4]

A) find the solution set in $R : (x - 4)^5 = 32$

B) If: $\left(\frac{3}{5}\right)^{x+2} = \frac{125}{27}$ then find the value of x ?

[Q5]

A) If: $3^x = 27$, $4^{x+y} = 1$, then find the value of x and y .

B) A box contains 7 black balls, 8 red balls and 5 white balls. If we draw one ball randomly, find the probability of getting: red ball
blue ball black or white ball

End of the questions

ALGEBRA – MODEL No**9****[Q1] Choose the correct answer:**

- (1) The S.S. in $R : x^2 + 9 = 0$ is
 a) $\{-3\}$ b) $\{3\}$ c) $\{-3, 3\}$ d) ϕ
- (2) If: $a - b = 9$, $a + b = 15$, then $a^2 - b^2 = \dots\dots\dots$
 a) 81 b) 135 c) 144 d) 225
- (3) If: $x^2 + 14x + b$ is perfect square then $b = \dots\dots\dots$
 a) 2 b) 7 c) 14 d) 49
- (4) $\frac{4 \times 2^{-1}}{3^{-1}} = \dots\dots\dots$
 a) 6 b) $\frac{1}{3}$ c) $\frac{1}{2}$ d) $\frac{1}{6}$
- (5) If: 4 times a number is 48, then third of this number is
 a) 16 b) 12 c) 4 d) 8
- (6) If: x is an odd number, then the next odd number is
 a) $X + 1$ b) $X + 2$ c) $X + 3$ d) $X + 4$

[Q2] Complete each of the following:

- 1) If: $6^x = 7$, then $6^{x-2} = \dots\dots\dots$
- 2) The solution set in $R : x^2 = 5x$ is
- 3) Quarter of the number $2^{50} = 2^{\dots\dots\dots}$
- 4) If: $(x + 5)$ is one factor of: $x^3 + 125$ then the other factor is ...
- 5) $1 \text{ L} = \dots\dots\dots \text{ cm}^3$.

[Q3]

A) Simplify : $\frac{4^{x+1} \times 9^{x-2}}{6^{2x}}$

B) Find the positive real number , if we add its twice to its square the result will be 35 ?

[Q4]

A) Factorize : $8y^3 + 1$ $x^2 - 10xy + 25y^2 - 36$

B) If : $8^{4x-1} = 32$, then find the value of x ?

[Q5]

A) Factorize : $4x^4 + 1$ $3x^2 + 7x + 2$

B) In a football league, the probability of a team to win is 0.6 and the probability of a draw is 0.3 .If the number of matches supposed to be played by that team is 30 matches .

How many matches do you predict the team draw ?

How many matches do you predict the team loss ?



End of the questions

ALGEBRA – MODEL No

10

[Q1] Choose the correct answer:

(1) If: $x^3 + 27 = (x + 3)(x^2 + k + 9)$, then $k = \dots\dots\dots$
 a) $-6x$ b) $-3x$ c) $3x$ d) $6x$

(2) If: $x^2 + y^2 = 7$, $xy = 3$, $(x - y)^2 = \dots\dots\dots$
 a) -1 b) 1 c) ± 1 d) 10

(3) If: $x^3 y^{-3} = 8$, then $\frac{y}{x} = \dots\dots\dots$

a) $\frac{1}{512}$ b) $\frac{1}{8}$ c) $\frac{1}{2}$ d) 2

(4) If: $3^x = 5$, then $27^x = \dots\dots\dots$

a) 9 b) 25 c) 125 d) 729

(5) If: $(x - 1)$ is one factor of: $x^2 - 4x + 3$ then the other factor is ...

a) $X + 3$ b) $X - 3$ c) $X + 1$ d) $X - 4$

(6) If: $x^2 + 4x + a$ is perfect square then $a = \dots\dots\dots$

a) 3 b) 4 c) 8 d) 16

[Q2] Complete each of the following:

1) If: $x + y = 7$, $x^2 - y^2 = 35$, $y - x = \dots\dots\dots$

2) The probability of an impossible event = $\dots\dots\dots$

3) If: $2^x = 5$, $2^{-y} = 3$, $2^{x+y} = \dots\dots\dots$

4) complete in the same pattern: $1, 4, 9, 16, 25, \dots\dots\dots$

5) If: $(25)^2 - (15)^2 = 10x$, then $x = \dots\dots\dots$

[Q3]

A) prove that : $\frac{(\sqrt{2})^2 \times 2^{1-x} \times 12^{2x-1}}{8^x \times 9^x} = \frac{1}{3}$

B) Two consecutive odd numbers their sum is 130 . find the two numbers ?

[Q4]

A) Factorize: ① $x^2 - 7x + 12$ ② $4x^4 + y^4$


B) If : $\frac{7^x \times 6^x}{14^2} = 3^{2-m}$, then find the value of $x + m$?

[Q5]

A) Factorize : ① $x^4 - 8x$ ② $ax - ay + x - y$

B) A basket contains balls numbered from 1 to 15 . a ball is drawn randomly. Calculate the probability of drawing ball carrying :

- ① An even number
- ② A number divisible by 3
- ③ A prime number


End of the questions

Q1) ① $X - y = \frac{X^2 - y^2}{X + y} = \frac{24}{8} = 3$

② $(X - 5)^0 = 1$

Then $X \in \mathbb{R} - \{0\}$

③ $X^2 - 4X = 0$

$X(X - 4) = 0$

$X = 0 \quad | \quad X = 4$

$S = \{0, 4\}$

④ $P(\text{sure event}) = 1$

⑤ $a = (4)^3 = 64$

⑥ $4^3(1+1+1+1) = 4^3 \times 4 = 4^4$

2

① $K = \frac{(100X^2)}{4(X^2)} = 25$

② $\left(\frac{X}{y}\right)^3 = \left(\frac{2}{1}\right)^3 \Rightarrow \frac{X}{y} = 2$

③ $2^y \times 5^y = 100 = 10^2$
 $\therefore y = 2$

④ $3(a^3 - b^3) = 3(a - b)(a^2 + ab + b^2)$
 $= 3 \times 7 \times 9 = 189$

⑤ $(8)^x = (2^3)^x = (2^x)^3 = 3^3 = 27$

3

① $5X^2 - 25 = 5(X^2 - 5)$
 $= 5(X - \sqrt{5})(X + \sqrt{5})$

② $X^2 - 3X - 28 =$
 $(X - 4)(X + 7)$

③ $8 - X^3 = (2 - X)(4 + 2X + X^2)$

④ $4X^2 - 12X + 9 = (2X - 3)^2$

Q4

A Assume $\begin{cases} \text{length} = X + 3 \\ \text{width} = X \end{cases}$

Area = length \times width

$40 = X(X + 3)$

$\therefore X^2 + 3X - 40 = 0$

$(X + 8)(X - 5) = 0$

$X = -8$

Rejected
 X

$X = 5$

$\therefore \text{width} = 5 \text{ cm}$

$\text{length} = X + 3$

$= 5 + 3 = 8 \text{ cm}$

$\therefore \text{Perimeter} = 2(5 + 8) = 26 \text{ cm}$

B) $2^{X-5} = 3^{2X-10} = 3^{2(X-5)} = 9^{X-5}$

$2 \neq 9$

$X - 5 = 0 \Rightarrow \boxed{X = 5}$

* $(X + 1)^5 = 32 = 2^5$

$X + 1 = 2 \Rightarrow \boxed{X = 1}$

5 A) $\frac{4^{X+1} \times 9^{2-X}}{6^{2X}}$

$= \frac{(2^2)^{X+1} \times (3^2)^{2-X}}{2^{2X} \times 3^{2X}} = \frac{2^{2X+2} \times 3^{4-2X}}{2^{2X} \times 3^{2X}}$

$= 2^{2X+2-2X} \times 3^{4-2X-2X} = 2^2 \times 3^{4-4X}$

$= \boxed{4 \times 3^{4-4X}}$

when $X = 1$

magnitude $= 4(3)^{4-4} = 4(3)^0 = 4$

B) $S = \{1, 2, 3, 4, \dots, 30\}$

① $P(A) = \frac{15}{30} = \frac{1}{2}$

② $P(B) = \frac{6}{30} = \frac{1}{5}$

③ $P(C) = \frac{5}{30} = \frac{1}{6}$

$A = \{1, 3, 5, 7, \dots, 29\}$

$B = \{5, 10, 15, 20, 25, 30\}$

$C = \{1, 4, 9, 16, 25\}$

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Model ② Algebra

$$① x^2 - y^2 = (x-y)(x+y) = 2 \times 7 = 14$$

$$② K = \pm 2\sqrt{9x^2}\sqrt{4} = \pm 12x$$

$$\therefore K = 12$$

$$③ 6^{x+1} = 6^x \times 6^1 = 11 \times 6 = 66$$

$$④ x^2 = -1 \Rightarrow x = \pm\sqrt{-1} \Rightarrow s.s = \emptyset$$

$$\notin \mathbb{R}$$

$$⑤ 2x^2 + 3x + 1 = (2x+1)(x+1)$$

$$⑥ \frac{2^{12} \times 5^{12}}{6^1} = \frac{6^{12}}{6^1} = 6^{11}$$

$$⑦ ① A = \{2, 3, 5\} \Rightarrow P(A) = \frac{3}{6} = \frac{1}{2}$$

$$② \left(\frac{x}{y}\right)^4 = (2)^4 \Rightarrow \frac{x}{y} = 2$$

$$③ 2^{x-y} = \frac{2^x}{2^y} = \frac{15}{15} = 1$$

$$④ (x^2 - xy + y^2)(x+y) = (x^3 + y^3)$$

$$\therefore x^2 - xy + y^2 = \frac{24}{8} = 3$$

$$⑤ 1 - 0.4 = 0.6$$

$$③ ① y(x-5) + 6(x-5)$$

$$(x-5)(y+6)$$

$$② x^2 + 7x + 6 = (x+6)(x+1)$$

$$③ x^3 - 125 = (x-5)(x^2 + 5x + 25)$$

$$④ 9x^2 - 16 = (3x-4)(3x+4)$$

$$⑦ ④ (A) \text{ Assume number} = x$$

$$\text{its square} = x^2$$

$$\therefore x^2 = 3x + 40$$

$$x^2 - 3x - 40 = 0$$

$$(x+5)(x-8) = 0$$

$$x = -5 \mid x = 8$$

rejected

$$\therefore \text{number is } \boxed{8}$$

$$③ x + x^{-1} = \sqrt{5} \Rightarrow x + \frac{1}{x} = \sqrt{5}$$

$$① x^2 + x^{-2} = x^2 + \frac{1}{x^2}$$

$$\therefore \left(x + \frac{1}{x}\right)^2 = [\sqrt{5}]^2 \quad \text{بالترتيب}$$

$$x^2 + 2 + \frac{1}{x^2} = \sqrt{5} \times \sqrt{5}$$

$$\therefore x^2 + \frac{1}{x^2} = 5 - 2 = 3$$

$$② x^3 + x^{-3} = \left(x + \frac{1}{x}\right)\left(x^2 - 1 + \frac{1}{x^2}\right)$$

$$= \sqrt{5}(3-1) = 2\sqrt{5}$$

$$⑦ ⑤ A)$$

$$\frac{8^x \times 9^x}{18^x} = 64$$

$$\frac{2^{3x} \times 3^x}{2^x \times 3^x} = 64 \Rightarrow 2^{3x-x} = 64$$

$$\therefore 2^{2x} = 2^6 \Rightarrow 2x = 6$$

$$x = 3$$

$$\therefore 4^{-x} = 4^{-3} = \frac{1}{4^3} = \frac{1}{64}$$

$$③$$

$$\text{probability of win} = 0.7$$

$$\sim \sim \text{draw} = 0.2$$

$$\sim \sim \text{loss} = 1 - 0.7 - 0.2 = 0.1$$

$$① \therefore \text{number of matches wins}$$

$$= 0.7 \times 30 = 21 \text{ matches}$$

$$② \therefore \text{number of matches loss}$$

$$= 0.1 \times 30 = 3 \text{ matches}$$

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model (3) Algebra

2020-2021

$$Q_1$$

$$① 3^x(1+1+1) = 3^x \times 3 = 3^{x+1}$$

$$② K = \pm 2(x)(6) = \pm 12x$$

$$K = \pm 12$$

$$③ K=49 \Rightarrow x^2+14x+49$$

$$(x+7)(x+7) = (x+7)^2$$

$$④ (2^x)^y = 2 \Rightarrow (2)^{xy} = 2^1$$

$$xy = 1$$

$$⑤ x^2 = 1 \Rightarrow x = \pm 1 \Rightarrow \{1, -1\}$$

$$⑥ (x-y)(a+b) = 3 \times 5 = 15$$

$$Q_2) ① P(\text{even}) = \frac{2}{5}$$

$$② 2^{x-5} = (5-3) = 2^1$$

$$x-5 = 1 \Rightarrow x = 6$$

$$③ \frac{(\sqrt{2})^{12}}{4} = \frac{(2^{\frac{1}{2}})^{12}}{2^2} = \frac{2^6}{2^2} = 2^4 = 16$$

$$④ x-y = \frac{x^2-y^2}{x+y} = \frac{12}{3} = 4$$

⑤ Zero

$$Q_3) ① 8x^3+27$$

$$= (2x+3)(4x^2-6x+9)$$

$$② 2x^2-18 = 2(x^2-9)$$

$$= 2(x-3)(x+3)$$

$$③ x^2+7x+12 = (x+4)(x+3)$$

$$④ ab-3b+5a-15$$

$$b(a-3)+5(a-3)$$

$$(a-3)(b+5)$$

$$Q_4) [A] \text{ Assume Number } = x$$

$$x^2+3x=18$$

$$x^2+3x-18=0$$

$$(x+6)(x-3) =$$

$$x = -6 \quad | \quad x = 3$$

rejected

Number is 3

$$B) (10.6)^2 - 1.2 \times 10.6 + (10.6)^2$$

$$(10.6)[(1.6) - 1.2 + 10.6]$$

$$= 10.6 \times 20 = 212$$

$$98 \times (102) = (100-2)(100+2)$$

$$= (100)^2 - (2)^2$$

$$= 10000 - 4 = 9996$$

$$Q_5) A) \therefore R.H.S = \frac{1}{27}$$

$$\therefore L.H.S$$

$$\frac{27^{x-1} \times 8^x}{(2\sqrt{2})^{2x} \times (3\sqrt{3})^{2x}}$$

$$= \frac{27^x \times 27^{-1} \times 8^x}{[(2\sqrt{2})^2]^x \times [(3\sqrt{3})^2]^x} = \frac{27^x \times 27^{-1} \times 8^x}{8^x \times 27^x}$$

$$= 27^{-1} = \frac{1}{27}$$

$$\therefore L.H.S = R.H.S$$

$$B) P(\text{succed in math}) = \frac{30}{40} = \frac{3}{4}$$

$$P(\text{failur in science}) = \frac{40-24}{40}$$

$$= \frac{16}{40} = \frac{2}{5}$$

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model (4) Algebra

- Q₁
- ① $3x^0 = 3x^1 = 3$
 - ② $(x-3y) = \frac{x^2-5xy+6y^2}{(x-2y)} = \frac{10}{5} = 2$
 - ③ $2^{20}(1+2) = 3 \times 2^{20}$
 - ④ $K=5 \Rightarrow$ By trying
 $5x^2+6x-27 = (x+3)(5x-9)$
 - ⑤ $x=5 \Rightarrow (5)^2 - 6(5) + n = 0$
 $n=5$
 - ⑥ $\frac{5^{x+2}}{5^x} - \frac{5^{x+1}}{5^x} = 5^2 - 5^1$
 $= 20$

- Q₂
- ① $(k+m)^2 = k^2 + 2km + m^2$
 $= k^2 + m^2 + 2km$
 $= 21 + 2(3) = 27$
 - ② $5x^2 - 2x - 7 = (x+1)(5x-7)$
 $\therefore (5x-7)$ other factor
 - ③ $3^x(3^1) = 1 \Rightarrow 3^{x+1} = 1 = 3^0$
 $\therefore x+1=0 \Rightarrow x=-1$
 - ④ $Kx^2 = \frac{400x^2}{4(25)} = 4x^2$
 $\therefore K=4$
 - ⑤ $x(a+b) + y(a+b)$
 $(a+b)(x+y) = 5 \times 3 = 15$

- Q₃
- ① $x^3 - 8 = (x-2)(x^2+2x+4)$
 - ② $9x^2 - 36y^4 = (3x-6y)(3x+6y)$
 - ③ يوجد تقابل بالـ $2x^2 - 10xy + 8y^2$
 $2(x^2 - 5xy + 4y^2)$
 $= 2(x-y)(x-4y)$
 - ④ $(x-y)(x+y) + 5(x+y)$
 $(x+y)(x-y+5)$

Q₄ [A] Assume Number X
 $S \quad x+2$

$$x^2 + (x+2)^2 = 74$$

$$x^2 + x^2 + 4x + 4 - 74 = 0$$

$$2x^2 + 4x - 70 = 0 \quad \div 2$$

$$x^2 + 2x - 35 = 0$$

$$(x-5)(x+7)$$

$$x=5 \quad | \quad x=-7$$

$$x+2=7 \quad | \quad x+2=-5$$

\therefore Two numbers are 5 or -5
 $5+7$
 $-5-7$

③ $2[(26.18)^2 - (23.82)^2]$
 $= 2[(26.18+23.82)(26.18-23.82)]$
 $= 2 \times 50 \times 2.36 = 236$

Q₅ (A) $3^{x+1} = 81 = 3^4$
 $x+1=4 \Rightarrow x=3$
 $5 \quad 4^{x+y} = 1 \Rightarrow 4^{3+y} = 1 = 4^0$
 $3+y=0 \Rightarrow y=-3$

③ $S = \{1, 2, 3, \dots, 24\}$
 $* P(A) = \frac{4}{24} = \frac{1}{6}$
 $A = \{6, 12, 18, 24\}$
 $B = \{1, 4, 9, 16\}$
 $P(B) = \frac{4}{24} = \frac{1}{6}$

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model [5] Algebra

Q1

$$1) x^2 - m = (x-7)(x+7) = x^2 - 49$$

$$m = 49$$

$$2) x^3 + y^3 = 15 \Rightarrow x^2 - xy + y^2 = \frac{15}{3} = 5$$

$$3) x=2 \Rightarrow (4-6x+K=.) \Rightarrow K=8$$

$$4) 2^x = 3 \text{ and } 3^y = 16 \Rightarrow (2^x)^y = 16 = 2^4 \Rightarrow xy = 4$$

$$5) n = 10 \Rightarrow x^2 + 7x + 10 = (x+2)(x+5)$$

$$6) \frac{5}{100} \times \frac{2}{100} = 10^x \Rightarrow \frac{10}{10000} = 10^x \Rightarrow (10)^{-3} = 10^x$$

$$x = -3 \text{ not exist in choice}$$

Q2

$$1) a = \pm 2(x)(5) = \pm 10x$$

$$2) x^2 - 3x - 5x = 0 \Rightarrow x^2 - 8x = 0$$

$$x(x-8) = 0 \Rightarrow x = 0, 8 \text{ in } \mathbb{R}$$

$$3) 2x^2 - 3x - 35 = 2x^2 - 10x + mx - 5m$$

$$-3x - 35 = x(-10+m) - 5m$$

$$-3x = x(-10+m) \Rightarrow -3 = -10+m$$

$$m = 7$$

$$\text{or } [-35 = -5m] \Rightarrow m = 7$$

or By factorize at first quickly

$$4) (x-3)^0 = 1 \Rightarrow x \neq 3$$

$$5) 8^{-x} = \frac{1}{8^x} = \left(\frac{1}{8}\right)^x = \left(\frac{1}{2}\right)^{3x}$$

$$= \left[\left(\frac{1}{2}\right)^x\right]^3 = 5^3 = 125$$

$$6) 25x^2 - 49 = (5x-7)(5x+7)$$

$$2) 2x^3 + 250 = 2(x^3 + 125)$$

$$= 2(x+5)(x^2 - 5x + 25)$$

$$3) x^2 - 8x + 12 = (x-2)(x-6)$$

$$4) 9b + 4b + 5a + 20$$

$$b(a+4) + 5(a+4)$$

$$(a+4)(b+5)$$

Q4

A) Assume width x , length $= x+3$

$$(x)(x+3) = 40$$

$$x^2 + 3x - 40 = 0 \Rightarrow (x-5)(x+8) = 0$$

$$x = 5$$

$$x = -8$$

$$x+3 = 8$$

rejected

$$\therefore \text{width} = x = 5 \text{ cm}$$

$$\text{length} = x+3 = 8 \text{ cm}$$

$$B) 1) (\sqrt{3})^{x-1} = 9 = 3^2 = (\sqrt{3})^4$$

$$\therefore x-1 = 4 \Rightarrow x = 5$$

$$2) 5^{x-1} \times 7^{1-x} = 1$$

$$5^{x-1} \times \left(\frac{1}{7}\right)^{x-1} = 1 \Rightarrow (5 \times \frac{1}{7})^{x-1} = 1$$

$$35^{x-1} = 35^0 \Rightarrow x-1 = 0 \Rightarrow x = 1$$

Q5

$$\frac{49^x \times 25^{2x} \times 3^{4x}}{(\sqrt{49})^{-x} \times (15)^{4x}} = \frac{7^{2x} \times 5^{4x} \times 3^{4x}}{7^{-x} \times 3^{4x} \times 5^{4x}}$$

$$= 7^{2x - (-x)} = 7^{3x} = 343 = 7^3$$

$$\therefore 3x = 3 \Rightarrow x = 1$$

$$\therefore 6^{2x} = 6^{(2)} = 36 \neq$$

$$B) S = \{12, 13, 14, 21, 23, 24, 31, 32, 34, 41, 42, 43\} \quad n(S) = 12$$

$$1) A = \{21, 41, 42, 23, 43, 24\}$$

$$P(A) = \frac{6}{12} = \frac{1}{2}$$

$$2) B = \{42, 24\} \Rightarrow P(B) = \frac{2}{12} = \frac{1}{6}$$

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model (6) Algebra

Q1 ① $K = \frac{100X^2}{4X^2} = 25$

② $3X^2 - 3X = 0 \Rightarrow 3X(X-1) = 0$

$S.S = \{0, 1\}$

③ $3^{x+y} = 3^x \times 3^y = 5 \times 7 = 35$

④ $a = 4 \Rightarrow$ عدد من حاصل ضرب 12 والفرد بينهم a
 $\Rightarrow a = 11 \in 1 \times 12$
 $a = 4 \in 2 \times 6$
 $a = 1 \in 3 \times 4$

⑤ $g^x > 0$
 $x \in \mathbb{R}$
 $g^0 = 1 > 0$
 $g^{-1} = \frac{1}{g} > 0$
 $g^1 = g > 0$

⑥ $X + 5$

Q2

① $(k+m)^2 = k^2 + 2km + m^2 = 21 + 2 \times 3 = 27$

$\therefore k+m = \pm \sqrt{27} = \pm 3\sqrt{3}$

② $5x^2 - 2x - 7 = (x+1)(5x-7)$

③ $\frac{2^{12} \times 3^{12}}{6} = 6^k \Rightarrow \frac{6^{12}}{6^1} = 6^k$

$\therefore 6^{11} = 6^k \Rightarrow k = 11$

④ $X(X^2 + 25) = 0$
 $\Rightarrow X = 0$
 $\Rightarrow X = \pm \sqrt{-25} \notin \mathbb{R}$
 $\therefore S.S = \{0\}$

⑤ $3^{(3)^x} = 1 \Rightarrow 3^{x+1} = 1 = 3^0 \Rightarrow x+1 = 0$
 $x = -1$

Q3 ① $X^6 - 7X^3 - 8 =$

$(X^3 - 8)(X^3 + 1) = (X-2)(X^2 + 2X + 4)(X+1)(X^2 - X + 1)$

② $16X^2 - a^2 + 6aX - 9X^2$

$16X^2 - (a^2 - 6aX + 9X^2)$

$16X^2 - (a - 3X)^2$

$(4X + a - 3X)(4X - a + 3X)$

③ ① $(14.06 - 4.06)^2 = (10)^2 = 100$

② $(998)^2 - 4 = (998-2)(998+2)$
 $= 1000 \times 996 = 996000$

④ A) Assume number is X

$2X - \frac{1}{X} = 1 \Rightarrow X^2$

$2X^2 - X - 1 = 0 \Rightarrow (2X+1)(X-1)$
 $X = -\frac{1}{2} \mid X = 1$

\therefore The number is 1 or $-\frac{1}{2}$

⑤ ① $3^{X-1} = 27 = 3^3 \Rightarrow X-1 = 3 \Rightarrow X = 4$

② $3^{X-3} = 2^{X-6} = \frac{2(X-3)}{2} = 4^{X-3}$

$2 \neq 3$
 $\Rightarrow X-3 = 0 \Rightarrow X = 3$

⑤ ④ $\frac{8^X \times 3^{2X}}{18^X} = 64$

$\frac{8^X \times 9^X}{2^X \times 3^X} = 64 \Rightarrow \left(\frac{8}{2}\right)^X = 64$

$4^X = 64 \Rightarrow 4^{-X} = \frac{1}{64}$

⑥ $S = \{1, 2, 3, 4, \dots, 40\}$

① $A = \{2, 4, 6, 8, 10, \dots, 40\}$
 $P(A) = \frac{20}{40} = \frac{1}{2}$

② $B = \{5, 10, 15, 20, 25, 30, 35, 40\}$
 $P(B) = \frac{8}{40} = \frac{1}{5}$

③ $C = \{1, 4, 9, 16, 25, 36\}$
 $P(C) = \frac{6}{40} = \frac{3}{20}$

④ $D = \{2, 3, 5, 7, 11, 13, 17\}$
 $P(D) = \frac{7}{40}$

⑪

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model (7) Algebra

Q1

$$(1) K = \pm 2(X)(5) = \pm 10X$$

$$K = \pm 10$$

$$(2) 4^3(1+1+1+1) = 4^3 \times 4 = 4^4$$

$$(3) X^{-1} = \frac{\sqrt{3}}{\sqrt{9}} \times \frac{\sqrt{9}}{\sqrt{9}} = \frac{\sqrt{27}}{9} = \frac{3\sqrt{3}}{9} = \frac{\sqrt{3}}{3}$$

$$(4) k^2 - m^2 = (k-m)(k+m) \\ = 9 \times 15 = 135$$

$$(5) 1 + \frac{1}{2} - (\frac{1}{2}) = 1$$

$$(6) \frac{\sqrt{2}^{12}}{4} = \frac{2^6}{2^2} = 2^4$$

Q2

$$(1) X^2(X+1)(X-1) \\ = X^2(X-1)(X+1) = (X^3 - X^2)(X+1)$$

$$(2) (X-3)(X-2)$$

$$(3) \text{Zero}$$

$$(4) (X+2)(X^2 - 2X + 4)$$

$$(5) (\sqrt{2})^6 = 2^3 = 8$$

Q3

$$P(\text{win}) = 0.6 \\ P(\text{Draw}) = 0.3 \\ P(\text{losses}) = 1 - 0.6 - 0.3 = 0.1$$

number of losses matches =

$$P(\text{losses}) \times \text{All number of matches} \\ = 0.1 \times 30 = 3 \text{ matches}$$

Q3

$$2X^2 - 5X - 3 = 0 \\ (2X+1)(X-3) = 0 \\ X = -\frac{1}{2} \quad | \quad X = 3 \\ S.S = \{ -\frac{1}{2}, 3 \}$$

Q4

(A)

$$\frac{2^{2n+1} \times 5^{2n+1}}{10^{2n}} \\ = \frac{(10)^{2n+1}}{(10)^{2n}} \\ = (10)^{2n+1-2n} = (10)^1 = 10$$

(B)

$$(9)^{X+3} = 3^{X+5} \\ (3^2)^{X+3} = 3^{X+5} \\ 3^{2X+6} = 3^{X+5} \Rightarrow 3=3 \\ \therefore 2X+6 = X+5 \Rightarrow X = -1$$

Q5

$$(1) 5X^2 - 3X - 2 = (X-1)(5X+2)$$

$$(2) a^2 - b^2c^4 = (a-bc^2)(a+bc^2)$$

$$(3) 64X^4 + n^4 = (8X^2 + n^2)^2 - 16X^2n^2 \\ = [8X^2 + n^2 - 4Xn][8X^2 + n^2 + 4Xn]$$

$$(4) X^2 - 2Xy + y^2 - Z^2 \\ (X-y)^2 - Z^2 \\ (X-y-Z)(X-y+Z)$$

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(13)

Model (8) Algebra

Q1 ① $a^2 - b^2 = (a-b)(a+b)$
 $16 = (-2)(a+b)$
 $a+b = \frac{16}{-2} = -8$

② $\sqrt{x+5} = 3$
 $x+5=9 \Rightarrow x=4 \Rightarrow \sqrt{x}=2$

③ $x^2 = -4 \Rightarrow x = \pm\sqrt{-4} \notin \mathbb{R}$
 $\sim \text{S.S} = \emptyset$

④ $\frac{2^{12} \times 3^{12}}{6} = \frac{6^{12}}{6} = 6^{11}$

⑤ $a = \frac{144x^2}{4(4x^2)} = 9$

⑥ $4^{x-1} = 4^x \times 4^{-1} = 5 \times \frac{1}{4} = \frac{5}{4} = 1.25$

$4^x = 5$ بعد تصحيح في لقول بالخط

Q2 ① $5^{x+3} = 7^{x+3}$ يوجد تصحيح في لقول بالخط
 $x+3=0 \Rightarrow x=-3$

② $125x^3 - 8y^3$

③ $xy = (\sqrt{2}+3)(\sqrt{2}-3) = (2-9)^5$
 $= (-7)^5 = -78125$

④ $(1-0.6) \times 300 = 120$ girls

⑤ $a^2 + 2ab + b^2 = 25 \Rightarrow (a+b)^2 = 25$
 $a+b = \pm 5$

Q3 ① A) $4a^4 - (9a^2 - 6a + 1)$
 $= 4a^4 - (3a-1)^2$
 $(2a^2 + 3a - 1)(2a^2 - 3a + 1)$

② $(7x-5)(7x+5)$

B) Assume number is x

$2x - \frac{1}{x} = 1$ *x

$2x^2 - 1 = x \Rightarrow 2x^2 - x - 1 = 0$
 $(2x+1)(x-1)$
 $x = -\frac{1}{2} \quad | \quad x = 1$

\therefore The number is 1 or $-\frac{1}{2}$

Q4 $(x-4)^5 = 32 = 2^5$

Power = Power \Rightarrow Base = Base

$x-4=2 \Rightarrow x=6$

B) $(\frac{3}{5})^{x+2} = \frac{125}{27} = (\frac{5}{3})^3 = (\frac{3}{5})^{-3}$

$x+2=-3 \Rightarrow x = -3-2 = -5$

Q5 A) $3^x = 27 = 3^3$
 $x=3$

$4^{x+y} = 1 \Rightarrow 4^{3+y} = 1 = 4^0$

$\therefore 3+y=0 \Rightarrow y=-3$

B) $S = \{7 \text{ Black ball, } 8 \text{ red balls, } 5 \text{ white balls}\}$

number of balls = $7+8+5 = 20$ Balls

$P(\text{red ball}) = \frac{8}{20} = \frac{2}{5}$

$P(\text{blue ball}) = \frac{0}{20} = 0$

$P(\text{black or white}) = \frac{12}{20} = \frac{3}{5}$

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model (g) Algebra

① $x^2 = -9 \Rightarrow s.s = \emptyset$

② $a^2 - b^2 = (a+b)(a-b)$
 $= 9 \times 15 = 135$

③ $b = \frac{14 \times 14 \times 2}{4 \times 2} = 49$

④ $4 \times \frac{1}{\frac{1}{3}} = \frac{4 \times 3}{2} = 6$

⑤ $4x = 48 \Rightarrow x = 12$
 $\frac{1}{3}x = \frac{1}{3} \times 12 = 4$

⑥ odd number is x
 the next odd = $x+2$

⑦ ① $6^{x-2} = 6^x \times 6^{-2}$
 $= 7 \times \frac{1}{36} = \frac{7}{36}$

② $x^2 - 5x = 0$
 $x(x-5) = 0$
 $s.s = 0, 5$

③ $\frac{2^{50}}{2^2} = 2^{48}$

④ $x^3 + 125 = (x+5)(x^2 - 5x + 25)$

⑤ $1L = 1000 \text{ cm}^3$

hint $m^3 \xrightarrow{\times 10^3} L \xrightarrow{\times 10^3} \text{cm}^3$
 $(dm)^3 \rightarrow \text{cm}^3$
 (mL)

① $\frac{4^{x+1} \times 9^{x-2}}{6^{2x}} = \frac{2^{2x+2} \times 3^{2x-4}}{2^{2x} \times 3^{2x}}$
 $= \frac{2^{2x+2-2x} \times 3^{2x-4-2x}}{1} = 2^2 \times 3^{-4}$
 $= 4 \times \frac{1}{81} = \frac{4}{81}$

② number = x
 $2x + x^2 = 35$
 $x^2 + 2x - 35 = 0$
 $(x-5)(x+7) = 0$
 $x = 5 \quad | \quad x = -7$
 number is 5 rejected

Q11

$8y^3 + 1 = (2y+1)(4y^2 - 2y + 1)$

$x^2 - 10xy + 25y^2 - 36$

$(x-5y)^2 - 36 = [x-5y-6][x-5y+6]$

② $8^{4x-1} = 32 \Rightarrow 2^{12x-3} = 2^5$

Base = Base \Rightarrow Power = Power

$12x-3=5 \Rightarrow 12x=8$
 $x = \frac{8}{12} = \frac{2}{3}$

③ ① $4x^4 + 1$
 $(2x^2+1)^2 - 4x^2$
 $(2x^2+1-2x)(2x^2+1+2x)$

② $3x^2 + 7x + 2$
 $(3x+1)(x+2)$

③ $P(\text{win}) = 0.6$
 $P(\text{draw}) = 0.3$
 $P(\text{loss}) = 1 - 0.6 - 0.3 = 0.1$

number of matches Draw = $0.3 \times 30 = 9$ matches

$n_{\text{loss}} = 0.1 \times 30 = 3 \text{ matches}$

$n_{\text{win}} = 0.6 \times 30 = 18 \text{ matches}$

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model (10) Algebra

Q1 ① $-3x = k$

② $(x-y)^2 = x^2 + y^2 - 2xy$
 $= 7 - 2(3) = 1$

③ $\left(\frac{x}{y}\right)^3 = (2)^3 \Rightarrow \frac{x}{y} = 2$

$\therefore \frac{y}{x} = \frac{1}{2}$
 ④ $(27)^x = (3)^{3x} = (3^x)^3 = 5^3$
 $= 125$

⑤ $x^2 - 4x + 3 = (x-1)(x-3)$

⑥ $a = \frac{16x^2}{4x^2} = 4$

Q2 ① $x^2 - y^2 = (x-y)(x+y)$
 $35 = (x-y) \times 7$
 $x-y = 5 \Rightarrow y-x = -5$

Belong $y-x = -(x-y) = -5 \checkmark$

② zero

③ $2^{x+y} = 2^x \times 2^y = 5 \times \frac{1}{3} = \frac{5}{3}$

④ 36, 49

⑤ $(25-15)(25+15) = 10 \times 40 = 400$
 $10 \times 40 = 400$
 $x = 40$

Q3 L.H.S = $\frac{1 \times 1-x \quad 2x-1 \quad 4x-2}{2 \times 2 \times 3 \times 2}$
 $\frac{3x}{2} \times 3^{2x}$
 $\frac{1+1-x+4x-2-3x}{2 \times 3} = \frac{2x-1-2x}{2 \times 3} = \frac{2^0 \times 3^{-1}}{2 \times 3} = \frac{1 \times \frac{1}{3}}{2 \times 3} = \frac{1}{12}$

R.H.S = $\frac{1}{3} \Rightarrow \therefore$ L.H.S = R.H.S

Q3 First number = x , next number = $x+2$

$x + x + 2 = 130$
 $2x = 128 \Rightarrow x = 64$

\therefore First number = 64

Second n = 66

Q4 ① $x^2 - 7x + 12$
 $(x-3)(x-4)$

② $4x^4 + y^4$
 $(2x^2 + y^2) - 4x^2y^2$
 $(2x^2 + y^2 - 2xy)(2x^2 - y^2 + 2xy)$

③ $\frac{7^x \times 6^x}{14^x} = 3^{2-m}$

14^x $\frac{(7 \times 6)^x}{14^x} = 3^{2-m}$
 $3^x = 3^{2-m}$

$x = 2-m \Rightarrow x+m = 2$

Q5 ① $x^4 - 8x = x(x^3 - 8)$
 $= x(x-2)(x^2 + 2x + 4)$

② $ax - ay + x - y$
 $a(x-y) + (x-y)$
 $(x-y)(a+1)$

③ $S = \{1, 2, 3, \dots, 15\}$

$P(\text{even number}) = \frac{7}{15}$

$P(\text{number is divisible by 3}) = \frac{5}{15} = \frac{1}{3}$

$P(\text{Prime number}) = \frac{6}{15} = \frac{2}{5}$

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Best wishes

بالقريب (دوني)

Q9

Model (1)

(1) Complete :

- 1) If $4x^2 + 12x + m$ is a perfect square then $m = \dots\dots\dots$
- 2) If the expression $x^2 + kx + 2$ can be factorized then $k = \dots\dots\dots$
- 3) If $(x-2)$ is a factor of the expression $x^2 - 7x + 10$ then the other factor is
- 4) If $x-y = 2$, $x^2 - y^2 = 16$ then $x+y = \dots\dots\dots$
- 5) If $(x-y)^2 = 16$, $x^2 + y^2 = 58$ then $x y = \dots\dots\dots$

(2) Choose the correct answer :

- 1) If $x+y = 5$, $x^2 - xy + y^2 = 7$ then $x^3 + y^3 = \dots\dots\dots$ (12 , 2 , 1.4 , 35)
- 2) The S.S. of the equation $x^2 - 4 = 0$ in R is ({4} , -2 , 2 , { 2 , -2 })
- 3) The probability of appearing an odd number when a regular dice is tossed once is
($\frac{1}{3}$, $\frac{1}{2}$, 0 , 1)
- 4) $3^3 + 3^3 + 3^3 = \dots\dots\dots$ (3^5 , 3^6 , 3^4 , 3^7)
- 5) If $2^x = 3$ then $4^x = \dots\dots\dots$ (9 , 6 , 5 , 27)
- 6) If $5^x = 4$ then $5^{x-1} = \dots\dots\dots$ (1 , $\frac{1}{2}$, $\frac{4}{5}$, 3)

(3) (a) A rectangle its length exceeds its width by 4 cm . and its area is 45 cm^2 find its perimeter

(b) If $\frac{8^x \times 9^x}{18^x} = 16$ find the value of 4^{-x}

(c) If $3^{2x-3} = 27$ find the value of x

(4) Factorize completely :

- | | |
|--------------------|---------------|
| a) $x^2 - 8x + 15$ | b) $x^2 - 49$ |
| c) $2x^4 + 250x$ | d) $x^4 + 4$ |

(5) a) A box has 8 white balls , 6 red balls and 3 green balls . if a ball is drawn randomly find the probability that the drawn ball is :

- | | | |
|--------|--------------|-----------|
| 1) red | 2) not green | 3) yellow |
|--------|--------------|-----------|

b) Find the S.S. in R :

$$2x^2 - 5(x-1) = 12$$

Model answer of model 1

(1) a) 9 b) ± 3 c) $(x - 5)$ d) 8 e) 21

(2) a) 35 b) $\{2, -2\}$ c) $\frac{1}{2}$ d) 3^4 e) 9

(3) a) Width = x , length = $x+4$, area = $l \times w$

$$X(x + 4) = 45 \quad \therefore \quad x^2 + 4x = 45 \quad \therefore \quad x^2 + 4x - 45 = 0$$

$$\therefore (x + 9)(x - 5) = 0 \quad \therefore x = 5 \text{ (because -9 is refused) .}$$

$$W = 5 \text{ cm , } l = 5+4 = 9 \text{ cm , perimeter} = (9+5) \times 2 = 28 \text{ cm}$$

b) $\frac{2^{3x} \times 3^{2x}}{2^x \times 3^{2x}} = 2^{2x}$, $16 = 2^4 \therefore 2^{2x} = 2^4 \therefore x = 2 \quad \therefore 4^{-x} = 4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

c) $3^{2x-3} = 3^3 \therefore 2x-3 = 3 \quad \therefore 2x = 6 \quad \therefore x = 3$

(4) a) $(x-3)(x-5)$ b) $(x-7)(x+7)$

c) $2x(x^3 + 125) = 2x(x+5)(x^2 - 5x + 25)$

d) $x^4 + 4x^2 - 4x^2 + 4 = (x^4 + 4x^2 + 4) - 4x^2 = (x^2 + 2)^2 - 4x^2 =$

$$(x^2 + 2 - 2x)(x^2 + 2 + 2x)$$

(5) a) 1) $\frac{6}{17}$ 2) $\frac{14}{17}$ 3) 0

b) $2x^2 - 5x + 5 = 12 \quad \therefore 2x^2 - 5x - 7 = 0 \quad \therefore (2x - 7)(x + 1) = 0$

$$x = \frac{7}{2} \quad \text{or} \quad x = -1 \quad \therefore \text{S.S in } R = \left\{ -1, \frac{7}{2} \right\}$$

Good Luck☺

Date: / /

Model (2)

(1) Complete :

1) If $x + y = 8$, $x^2 - y^2 = 16$ then $x - y = \dots\dots\dots$

2) $3(5)^0 = \dots\dots\dots$ 3) If $(2x - 1)$ is a factor of the expression $(2x^2 - 3x + 1)$ then the other factor is $\dots\dots\dots$

4) If $(\sqrt{2})^x = 2\sqrt{2}$ then the value of $x = \dots\dots\dots$

5) If $1 + m = 9$, $1 - m = 4$ then the value of the expression :
 $x^1 + x^m - y^1 - y^m = \dots\dots\dots$

(2) Choose the correct answer :

1) If $5^x = 13$ then $5^{x+1} = \dots\dots\dots$ (14 , 206 , 70 , 65)

2) $(99)^2 - 1 = \dots\dots\dots$ (98 , 9800 , 8900 , 100)

3) If the probability of success of a student is $\frac{7}{9}$ then the probability of his failure is $\dots\dots\dots$ (0 , 1 , $\frac{2}{9}$, $\frac{7}{9}$)

4) If $(4x^2 + kx + 9)$ is a perfect square then $k = \dots\dots\dots$

(± 12 , ± 6 , ± 36 , ± 72)

5) If $(x + y)^2 = 29$, $xy = 10$ then $x^2 + y^2 = \dots\dots\dots$ (19 , 3 , 39 , 9)

6) If $2^x = 3$ then $8^{-x} = \dots\dots\dots$ (27 , -27 , $\frac{1}{27}$, $\frac{-1}{27}$)

(3) a) Factorize completely :

1) $x^2 + 10x - 24$ 2) $3x^2 - 75x$ 3) $b^3 + 125c^3$ 4) $x^4 + 4y^4$

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b) A card is drawn randomly from a set of cards numbered from 1 to 24 .

find the probability that the drawn card is

1) a multiple of 4 2) a multiple of 6 3) a multiple of both 4 and 6 together 4) a multiple of either 4 or 6

(4) a) Find the S.S. in R : $x(x-3) = 5x$

b) Two positive integers. One of them exceeds the other by 4 and their product is 45 . Find the two numbers

c) If $x = 3$ and $y = \sqrt{2}$. Find the value of $(\frac{x}{y})^{-3}$ in the simplest form.

(5) a) A factory of ready made clothes produces 7000 pieces of cloth daily . if a random sample of 1000 pieces is taken and by investigating it . it is found that 25 % of them are defective pieces . find the number of the defective pieces in that day

b) If $\frac{49 \times 25^{2n} \times 3^{4n}}{7^{-n} \times 15^{4n}} = 243$. find the value of 6^{2n}

Model (3)

(1) Choose the correct answer :

- 1) If $(a + b)^2 = 12$, $a^2 + b^2 = 10$. then $a b = \dots$ (2 , 1 , -1 , 120)
- 2) If $x - y = 7$ then $x^2 - 2 x y + y^2 = \dots$ (14 , 49 , 7 , 21)
- 3) $(x - 5)^0 = 1$ if $x \in \dots$ (\mathbb{R} , $\mathbb{R} - \{ 5 \}$, $\{ 5 \}$, \emptyset)
- 4) If $(9 x^2 + k x + 1)$ is a perfect square then $k = \pm \dots$
(1 , 3 , 6 , 9)
- 5) The S . S . of the equation $x^2 - 3x = 0$ in \mathbb{R} is
({ 0 , 3 } , { 0 , -3 } , { 0 } , { 3 })
- 6) If $x^3 - k^3 = (x - k) (x^2 + 4x + k^2)$ then $k^3 = \dots$ (2 , 4 , 8 , 64)

(2) Complete :

- 1) $(3x - \dots) (\dots - 5) = 3x^2 - \dots + 35$
- 2) $(105)^2 - (95)^2 = 10 \times \dots$
- 3) If $(2c - 5) (3c - 2) = 6c^2 + kc + 10$ then $k = \dots$
- 4) If $a - b = 5$, $a + b = 3$ then $a^2 - b^2 = \dots$
- 5) If $cx - dx + cy - dy = 40$, $c - d = 4$ then $x + y = \dots$

(3) a) If $\frac{3^x \times 8^x}{(12)^{x+1}} = \frac{1}{3}$ then find the value of x .

b) Factorize completely :

- 1) $x^2 - 7x - 8$ 2) $(x - y)^2 - 25$
- 3) $27 b^3 - 8 c^3$ 4) $9 x^4 - 25 x^2 + 16 b$

Date: / /

(4) a) find the S.S in R :

$$x (x - 5) = 14$$

b) A rectangle its length exceeds its width by 6 cm . and its area is 55 cm^2 . find its length and its width

(5) a) In the operation of production of 400 electric lamps . if the number of defective units of them is 24 units .

1) what is the probability of the defective units

2) If the daily production of this factory is 1500 electric lamps . find the number of good units in this day ?

b) If $(\sqrt{\frac{2}{3}})^x = \frac{9}{4}$. find the value of $(\frac{2}{3})^{x+1}$

Date: / /

Model (4)

- a) $(309)^2 - 309 \times 209 = \dots\dots$ (3900 , 30900 , 3090 , 3009)
- b) If 1 is a root of the equation $x^2 - 2x + b = 0$ then $b = \dots\dots$
(zero , 1 , -1 , -3)
- c) If $25x^2 + mx + 4$ is a perfect square trinomial then $m = \dots\dots$
(10 , 100 , 20 , 5)
- d) If $a^2 + b^2 = 11$, $ab = 5$ then $a - b = \dots\dots\dots$
(6 , ± 1 , 1 , -1)
- e) one fourth of $4^{20} = \dots\dots$ (4^5 , 1^{20} , 4^{19} , 4^{21})

(2) Complete :

- a) If $x^3 + y^3 = 35$, $x^2 - xy + y^2 = 7$ then $x + y = \dots\dots\dots$
- b) A rectangle its two dimensions are $(a + 3)$ cm , $(a - 3)$ cm .
then its area = (.....) cm^2 .
- c) If $(x + 4)$ is a factor of the expression $(x^2 + 9x + 20)$ then the other factor is
- d) The S.S of the equation : $(x + 3)(3x - 5) = 0$ in R is { }
- e) The simplest form of the expression $3^0 + (3)^{-1} - (\frac{-1}{\sqrt{3}})^2 = \dots\dots$

(3) a) Factorize completely :

- 1) $x^3 - 3x^2 + 2x$
- 2) $x^4 - 16$
- 3) $8x^3 - 27$
- 4) $x^2(x^2 - 19y^2) + 25y^4$

Date: / /

b) A box contains 40 cards numbered from 1 to 40 . a card is drawn randomly find the probability that the drawn card carries

1) an even number

2) A number divisible by 3

3) an even number divisible by 3

(4) a) If $(32)^{x-1} = 8^{2x+1}$ find the value of x .

b) two consecutive odd numbers the sum of their squares is 120
find these two numbers .

(5) a) If $a + b = 3$, $x - y = 2$ find the value of the expression
 $ax - ay + bx - by$ using factorizing by grouping .

b) Simplify :
$$\frac{(15)^{-2} \times (\sqrt{5})^3 \times (3)^3}{9 \times (\sqrt{5})^{-3}}$$

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Model (5)

(1) Choose the correct answer :

- 1) If $(25b^2 + 40b + k)$ is a perfect square then $k = \dots\dots\dots$ (4 , 8 , 16 , 64)
- 2) If $(x + y)^2 = 25$, $x^2 + y^2 = 13$ then $xy = \dots\dots$ (2 , 6 , -6 , 12)
- 3) If $3^x = 5$ and $5^y = 9$ then $xy = \dots\dots\dots$ (45 , 2 , 15 , 14)
- 4) If the probability of success of a student is $\frac{5}{7}$ then the probability of his failure is
(0 , $\frac{2}{7}$, $\frac{1}{2}$, 1)
- 5) The S.S. of the equation : $x^2 - 8x = 0$ in R is ({8} , {0,-8} , {0,8} , { 0 })
- 6) If $x^3 + y^3 = 91$, $x + y = 13$ then $x^2 - xy + y^2 = \dots\dots$ (104 , 78 , 14 , 7)

(2) Complete:

- 1) If $x = (5 + 2)^9$, $y = (5 + 2)^{-9}$ then $xy = \dots\dots\dots$
- 2) The simplest form of the expression $3^{-2} \times 3^{-3} \div 9^{-3} = \dots\dots\dots$
- 3) If $(x - 3)$ is a factor of the expression $x^2 - 8x + 15$ then the other factor is
- 4) $(89)^2 - (11)^2 = \dots\dots\dots$
- 5) The expression $x^2 + kx + 3$ can be factorized if $k = \dots\dots\dots$ or

(3) (a) Factorize completely :

- 1) $x^2 - 7x - 8$ 2) $(a-b)^2 - 49$ 3) $2x^3 - 250y^3$ 4) $x^4 + 4y^4$

(b) If $l-m = 3$, $x + y = 7$ then find the value of : $(lx - my + ly - my)$ using factorization by grouping

(4) (a) Find the S.S. of the equation : $x(2x - 1) = 6$ in R .

(b) A set of numbered cards from 1 to 20 . if a card is drawn randomly find the probability that the drawn card carries a number
1) multiple of 4 2) divisible by 7 3) multiple of 4 or divisible by 7

(5) (a) Find the positive integer that is its square is more than its three times by 40

(b) If $a = \sqrt{3}$, $b = \sqrt{2}$ find the value of : $\frac{a^3 + b^3}{a+b}$